HE IRON AGE

THE NATIONAL METALWORKING WEEKLY February 23, 1950

ENGINEERING LIBRARY FEB 28 1950

THIS TEAM CAN STOP A THREAT TO AMERICA'S INDUSTRIAL LEADERSHIP AND BUSINESS PROSPERITY

If the present obsolescence trend in machinery continues in this country we will endanger our world renowned "ability to produce". But apparently little is being done to stop this trend. Should we wait until it's too late to act?

This team of three has the power to reverse this course and insure our economic stability, high standard of living, and national safety.







NAGEMENT must continually review manufacturing methods with an to increasing efficiency. And realize the necessity of investing in cost ing, production increasing equipment.

NT WORKERS must utilize new equipment to fullest advantage so that r companies can compete successfully in today's market.

VERNMENT must adopt a realistic depreciation policy on machine invest- nt and allow venture capital to reap the fair rewards of success.

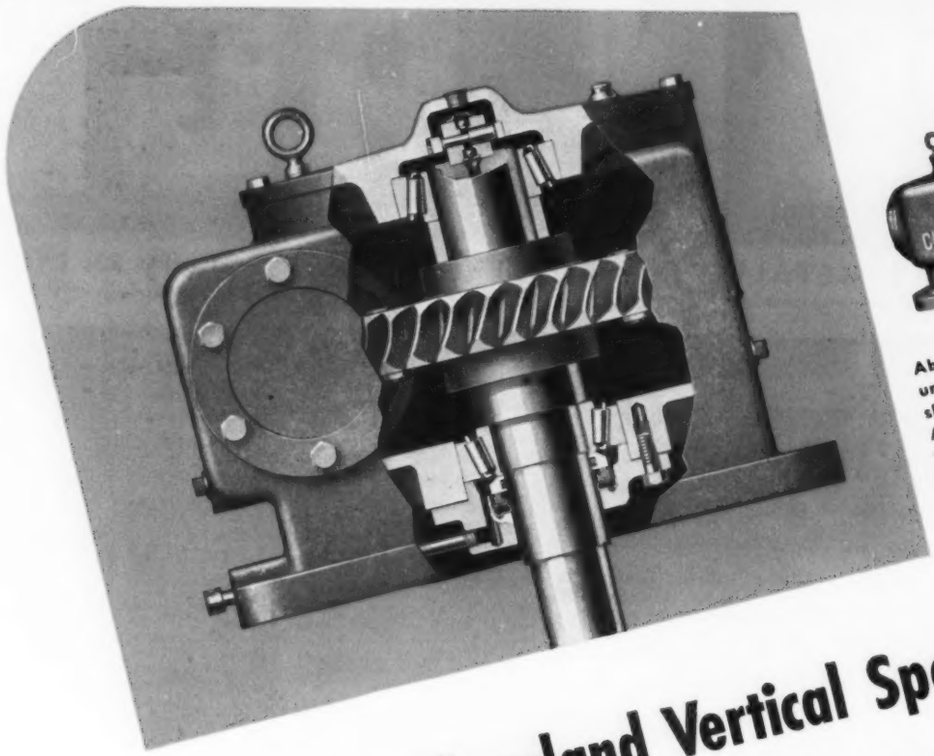
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NEW BRITAIN-GRIDLEY MACHINE DIVISION
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Above—Exterior view Type ND unit. NU unit (not shown) has slow-speed shaft extending up. At left—Cutaway section to show tapered roller bearings on gear shaft, positive face-type oil seal, unique lubricating pump and oil drain at base of housing.

A new series of Cleveland Vertical Speed Reducers

● NU and ND worm gear units—in seven sizes each (50 to 500) are ready for prompt delivery. They are particularly suited to such equipment as agitators and mixers, and for use in connection with supplementary low speed spur gear drives, without outboard bearings.

Outstanding features which insure that these new vertical drives will deliver long and trouble-free service are:

Extra heavy tapered roller bearings on gear shaft.

Continuous lubrication of top bearing by positively driven pump mounted on upper end of gear shaft (on lower end in Type NU).

Positive face-type oil seal below lower gear shaft bearing to prevent leakage.

Heavy base flange extends around all four sides. All parts liberally oversized and precision built.

Write for Bulletin 125 for full description of Types NU and ND, including capacity charts and dimension data. The Cleveland Worm & Gear Co., 3252 East 80th Street, Cleveland 4, Ohio.

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CLEVELAND
Worm Gear
Speed Reducers

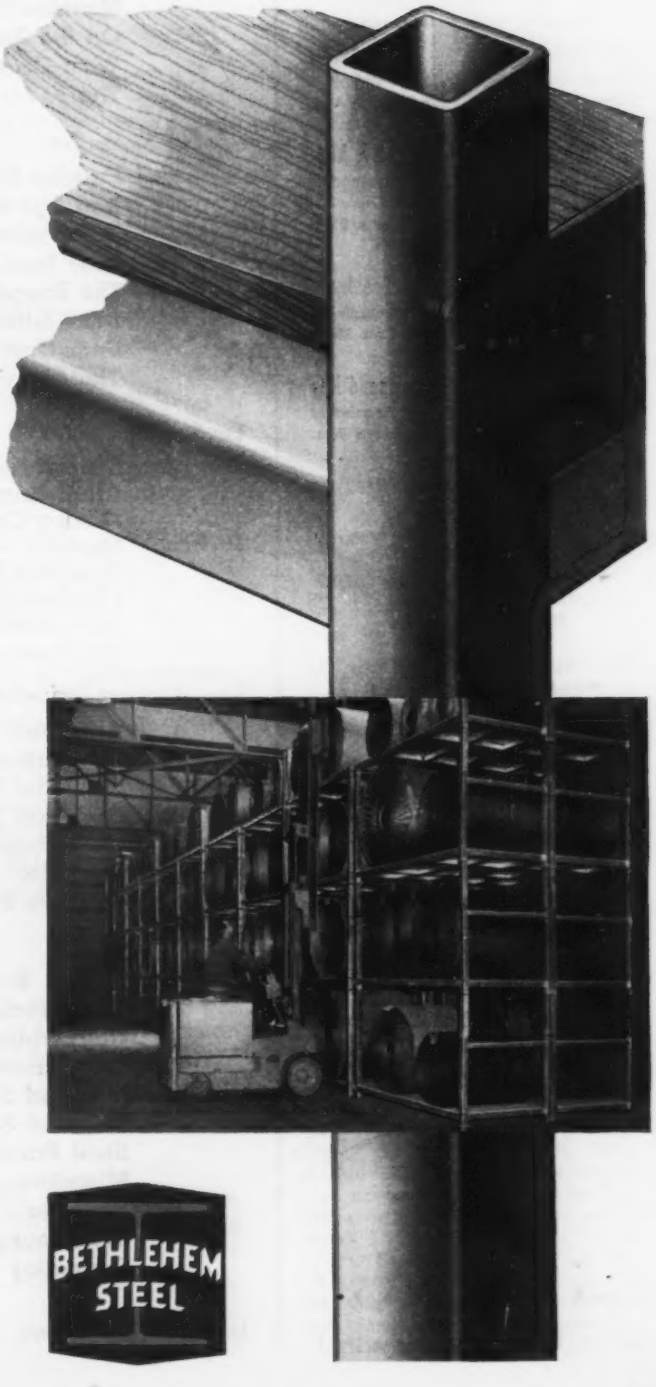
CORNER POSTS

FOR PALLET RACKS

MADE FROM

Cold-Formed Shapes





The cold-formed shape shown here is used for corner posts by a manufacturer supplying steel pallet racks and other storage racks to various types of industry. The lightweight shape provides strength, and also makes possible high stacking and maximum use of storage space. We turn it out as square tubing, using 11-gauge strip steel, and furnish it unwelded, in 30-ft lengths.

Shapes for pallet racks are but one of a long line of uses for Bethlehem Cold-Formed Shapes. Here are some other ways in which these shapes are serving manufacturers: sills for freight elevator doors; frames for house trailers; parts for ornamental railings; hatch covers for seagoing vessels. And cold-formed shapes are so versatile, and so economical, that it's small wonder so many new applications are continually being found.

Bethlehem Cold-Formed Shapes are produced from strip, sheets or plates. They are uniform in thickness and virtually scale-free. They have an excellent strength-weight ratio. They come in all gauges from 7 to 24, inclusive.

Look around your plant and you may find one, or perhaps several places where Bethlehem Cold-Formed Shapes could be used to advantage. Or better still, drop us a line, and we'll be glad to study your operations and suggest possibilities.

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THE IRON AGE

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February 23, 1950 • • • VOL. 165, NO. 8

Special Article



Selling welfare enterprise is the only way to halt the trend toward the welfare state. A growing group of enlightened management recognizes this. By trial and error, they have learned that an effective educational program is the key to good human relations. An IRON AGE Special Report.—p. 67.

Issue Highlights



Powder metallurgy invades the field of higher strength metals. Infiltration of copper into an iron skeleton, combined with sintering, coining and heat treating, produces a high strength part cheaper than the conventional forgings previously used for jet engine compressor blades.—p. 74.



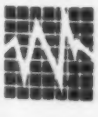
Reduction in tooling costs in low and high volume production, deeper draws in one operation, drawing after finishing, and considerable economies for those industries having frequent product design changes are some of the advantages claimed for Marform deep drawing. The special Marform machine is described.—p. 78.



The discovery of fabulous bodies of high grade ore in Labrador and Venezuela have aroused unusually keen interest. Tom C. Campbell, Editor of THE IRON AGE, who has just returned from front line operations in Venezuela, presents an authoritative comparison of the overall ore picture throughout the world. This is the first such account by any editor who has actually made on-the-spot inspections of both of these important discoveries.—p. 105.



The aluminum foil industry is a business on its way up. New producers have been entering the field freely. But growing demand has been sufficient to absorb the new capacity. The food packaging industry offers the largest potential market.—p. 95.



The business outlook for tool and die makers is improving. While business is still spotty in some sectors, television and auto transmission orders are helping to drive the blues away.—p. 101.

Coming Next Week



Copper and aluminum are employed as precipitation-hardening elements in place of carbide formers used in the past in two new Armco steels. These steels have excellent corrosion resistance in addition to high strength properties, offering new applications for stainless.

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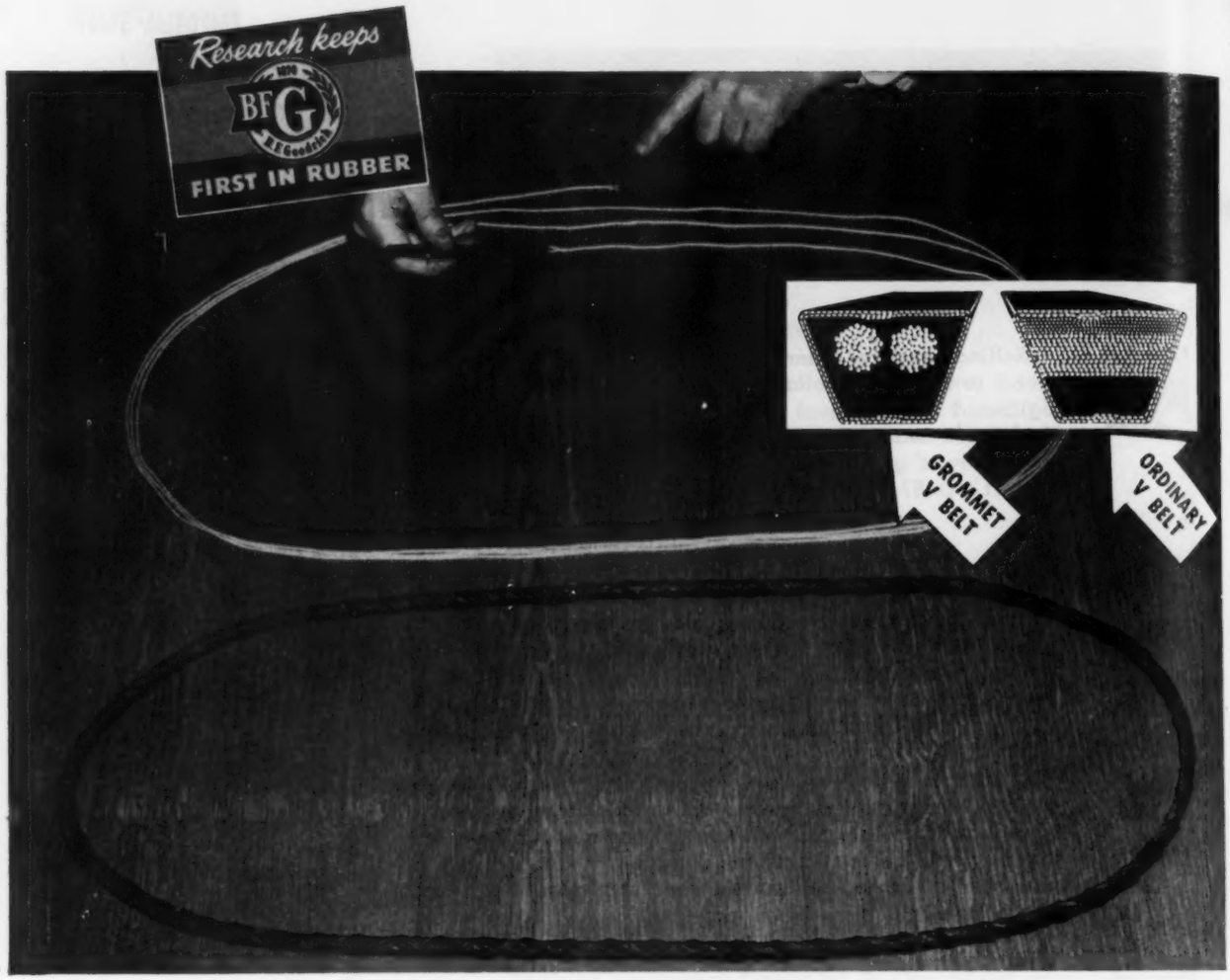
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How to eliminate most of your V belt cord failures

B. F. Goodrich grommet V belts last 20 to 50% longer, cost no more

IF YOU are now using ordinary V belts, most of your cord failures occur in the overlap section, where cord ends are joined. B. F. Goodrich grommet V belts use *endless* cord grommets, thus do away with the overlap section, eliminate the cord failures that normally occur there. That's one reason why BFG grommet belts last 20 to 50% longer, though they cost *not one cent more!* Here's the whole grommet story —

No cord ends — A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends (as in an ordinary V-belt cord section), no stiff, weakened section of "spliced" cord. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

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Better grip, less slip — Because a grommet is endless, free of stiff overlap, a grommet V belt is more flexible, grips the pulleys better. Size for size, grommet V belts will give ⅓ more gripping power, pull heavier loads with a higher safety factor.

Only B. F. Goodrich has the grommet! — Twin grommet construction is an exclusive, patented B. F. Goodrich feature — no other V belt is a grommet V belt. (U. S. Patent No. 2,233,294) To get genuine grommet V belts (at present made in D and E sections only) see your local B. F. Goodrich distributor. Ask him to show you his "X-ray" belt that illustrates grommet construction clearly. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Grommet V Belts BY

B.F.Goodrich

Editorial

INDUSTRY VIEWPOINTS

Don't Let The Guard Down

THERE is some dangerous thinking going on these days. Recently an election in Australia put the labor government out. Many people in the United States have latched on to this as a sign things are going to be all right here.

They think or hope that the election in Great Britain will mean that the labor government will get a setback. They think or would like to think that things are swinging to the right here. Well it's alright to think that way but it is bad to depend on it too much.

There is no time—now or later—to feel that those who believe in personal and free enterprise should be off guard. People who want the social state or even something more to the left never sleep. Nor do they tire in their propaganda. They are forever at it. They tell their story again and again in hopes that they will get new converts.

There is still a large antibusiness feeling in this country. It won't disappear overnight. There will be plenty of people ready to throw rocks or anything else. Many of them know how to do it. If they reach more politicians and do a good job —in their language—on business it is business' fault and no one else's.

If there is to be any letdown by industry to get its point across to the public it will be suicidal. There is never a time for business to let up on explaining what it does, why it does it and what it is trying to do. But even when it does a good job here there is still room for improvement. Whether that improvement comes depends on what business men are willing to do for a cause they say they believe in.

For years industry has been kicked around by politicians. Business men in conversation have kicked politicians around. Maybe business has not made its points clear enough to its representatives—representatives not voted for but representing them. Talk and attack will not do much good. Now is the time for men to come to the aid of the party.

Now is the time to write letters to representatives. Now is the time to explain quietly but forcefully why business is part and parcel of the future if we are to have one.

There is another thing business must do sooner or later. It might as well be now. The soft words from Washington alleging friendship for business these days are political pap.

Let business men plan campaigns and run for offices themselves. This is still a free country. We mean run for offices in towns, in boroughs, in cities, in states and in the nation. Not next year or sometime in the future, but now.

If business men do decide to get into politics—and they should—they will see what politics are, the people will see them and everyone will benefit. Industry has plenty of good candidates. They should be used. Business men who do not take an active interest in civic affairs from bottom to top are missing a good bet.

Tom C. Campbell

Editor

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NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► The Government, despite all its fuss over basing points and freight absorption, is in effect doing the same thing in its "uniform freight rate" system of selling synthetic rubber. Buyers pay a uniform base pound price f.o.b. the plant or warehouse, plus a fixed per pound freight charge regardless of destination. The Government either absorbs freight or collects phantom freight.

► A new method for making extremely fine wire involves reducing a relatively large diameter wire to the desired small size by electro-polishing. Stainless wire of 0.15-mil diam. is being made this way.

► A major producer of machine tools is starting a rebuilding and trade-in program which is designed to stimulate sales of new machines and meet the competition of used machinery dealers.

► Some attractive export steel tonnage—primarily in sheets—is floating around for second-half shipment. At least one major producer is considering taking a piece of it for the third quarter.

► Experiments now under way indicate that reverse periodic plated silver coatings have an electrical conductivity a few percent higher than that of normally plated coatings. In some fields—notably electronics—even a small gain in conductivity is important.

► A project to use a plastic liner in conventional steel pipe is now being considered for applications requiring corrosion resistance in places where wooden pipe is now being used. By itself, plastic has pressure limitations which the new idea would solve if it develops commercially. One use would be in mines.

► A large nonferrous metals producer has found that research in lubrication pays big dividends. The company can trace savings of $1 million a year to proper application of available lubricants to its operations. Intangible benefits may double or triple this figure.

► The glass industry is going all out in an effort to capture more television tube business from steel. Most small tubes are glass; most large ones are metal with a glass viewing screen. Key problem for stainless makers now is to reduce gage of steel now used and still retain safety requirements.

► A modern 200-in. steel plate mill is now lying idle in Japan. Chances are it is headed for the scrap heap unless an American producer is interested enough to buy it. This is unlikely since the one mill of this size in the U. S. can more than handle peacetime demand for extra wide plates. The Japanese mill was built in 1944.

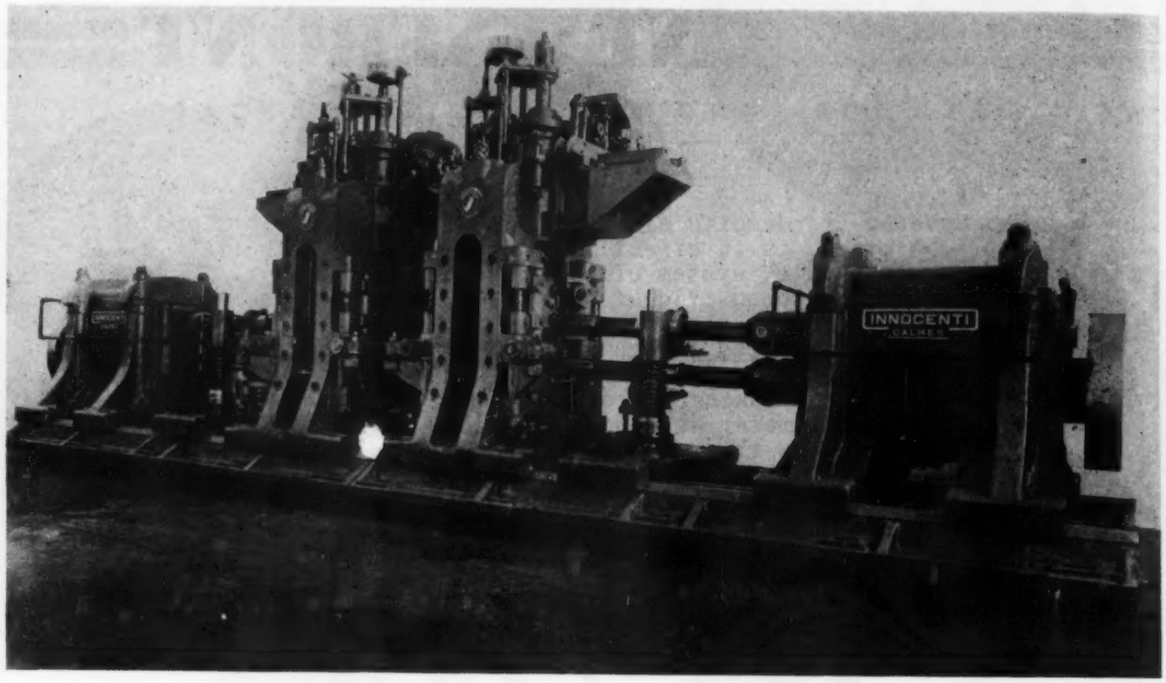
► Vacuum plating techniques show promise of widespread industrial use. At present the process is mainly used in metallizing plastic objects like toys. Very thin deposits are applied.

► Really new automobile engines come dear. One firm has spent 6 years and $1 million on a new engine. Eight different engines, four fuel intake systems and two different types of crankshafts were tried. One success out of five tries is about par for the industry.

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Conversion Increases Sharply

Operating Rate Is Tentative

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

THE major steel producers have about reached the bottom of their coal piles. Plans for drastic cutbacks in production have already been laid. They will be announced late this week if coal is not on its way from the mines. Some of these plans include curtailment of blast furnace operations by as much as 75 pct.

The situation is critical for steel consuming industries, too. They are being pinched from four directions: (1) Interruption of vital steel shipments, as steel suppliers are forced to curtail output for lack of coal; (2) exhaustion of their own coal stocks; (3) loss of production from industrial power curtailments, and (4) lack of strategic parts from suppliers who have been forced to shut down or curtail their production.

Cuts in steel output are going to be felt immediately by some industries. Those which use sheets and strip, and some of those which use bars, haven't had a chance to build up their inventories since the steel strike. In some cases these inventories are critically low now. Their efforts to assure themselves of an operating supply of steel and rebuild their inventories are adding strong pressure to demand for steel items which were already in short supply.

Conversion Activity Increasing

Users of heavy plate and structural steel are in better shape. Most of them report their inventories will carry them for from three weeks to two months at present rates of production. However, a few of these users are not in such good position. Because they were pessimistic about the business outlook, they didn't keep their inventories up or press for mill quotas. Now they wish they had.

Auto companies which had been piddling in conversion are now going into it on a larger scale. One car producer is buying 50,000 tons of semi-finished steel per month for conversion purposes. It has booked such orders with at least one steel company into April. Another auto maker has enough steel lined up for its own needs into June. Other manufacturers of consumer goods are jumping back on the conversion merry-go-round, too. These include appliance and farm implement makers.

But the wild element that came with conversion in the steel market three years ago is not present this week. The scrap market is on an even keel, and the scramble for ingots is much more restrained. Ingots are reported selling in the conversion market for $60 a ton, which is a lot better than the former "circus" market prices. Lining up rolling space is currently a big bottleneck in the conversion market.

Some Sales Executives Sceptical

Freight car orders, which dwindled alarmingly last year, have turned up sharply, adding more pressure to steel demand. Car builders are scouting around the steel plants these days looking for tonnage. Demand from this source is expected to continue to pick up in the months immediately ahead. Those in the industry estimate that 50,000 to 70,000 cars may be built this year. This is still small compared with the 112,000 plus cars delivered in 1948, and the 92,500 delivered last year.

Steel sales executives are not being lulled into sleep by the clamor for their products. Most of them are confident that demand will hold at a high level for the first six months. But some of them are already hinting that the bloom may be off for some consumer goods before long.

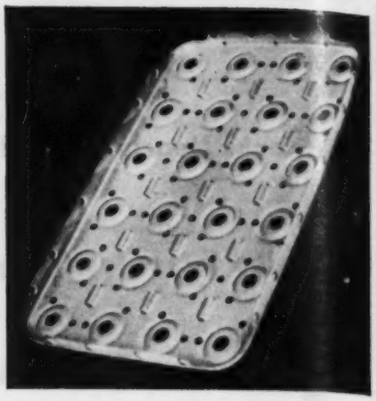
Operating Rate Is Tentative

For the third week in a row nothing sensational developed in the scrap market, despite the fact that mills are increasing their scrap charge and reducing their hot metal charge in open-hearth furnaces. Strongest activity was reported at Pittsburgh and in the Valley. At Pittsburgh a 50¢ a ton increase in No. 1 heavy melting steel raised THE IRON AGE steel scrap composite 17¢ a ton to $27.42 per gross ton.

Steelmaking operations are scheduled at 88.5 pct of capacity, down only half a point from last week. But this rate is tentative and will probably be revised sharply downward if no coal is mined this week.

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These are the parts of the patented bottle case—produced by modern assembly-line methods: Into a punch press goes a coil of 150S—out comes finished case bottoms.



Two spools of coated steel wire and a coil of 150S are simultaneously fed into a rolling machine to form the body in a completely automatic operation.

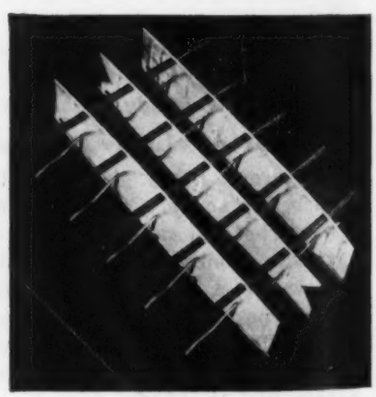
One every 6 seconds from 150S



Metal Carrier Corporation, Grand Rapids, produces long-lasting, rust-proof aluminum bottle cases like this at the rate of one every six seconds!

By using the new Kaiser Aluminum alloy 150S in place of 52S, they save production steps, slash production costs 4¢ per unit. And they turn out an easily formed case that's strong and durable, that never needs paint, that weighs only 3½ pounds.

You can profit by converting to 150S, too! *It's the world's most versatile aluminum alloy.* Today—call our nearest sales office for more information. Kaiser Aluminum alloy 150S is the exclusive development of Kaiser Aluminum & Chemical Corporation.

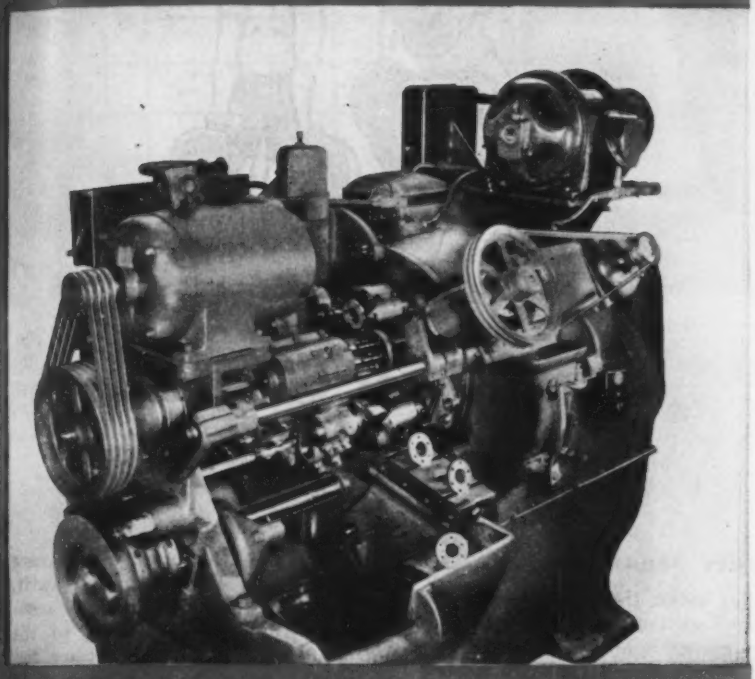


Interior bottle divider is formed on a third line of rolling machines and punch presses. Parts are automatically conveyed into the final assembly line, where the interior nest is snapped into the body.

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"BAIRD 7" Six-Spindle Horizontal Indexing Lathe tooled up for operating on two parts: (1) turning small Piston and drilling wrist pin hole in same (independently motor-driven cross drilling unit shown at right center); (2) turning Cylinder Cover Plate shown, and drilling six holes in same. Baird Chucking Machines can readily be equipped to handle, in one set-up, a large range of varied and special machining operations. What have **you** to do?

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Some of the EXCLUSIVE FEATURES which have made the Baird 7 Six-Spindle Horizontal Indexing Lathe outstanding are:

● **INDEPENDENT TOOL SLIDES.** The longitudinal tool slides may have different strokes and the cross slides are independent and have their strokes, all as best suits the job. All tool slides have micrometer adjustment.

● **DIFFERENT SPEEDS AT SPINDLES.** Ability to choose a speed for the spindle at each work station to suit the operation to be performed at that station permits the best product in least time.

● **AUTOMATIC CHUCKING.** Operator has both hands free to handle the work. No levers or handles to require his attention or take his time.

● **ATTACHMENTS.** Several readily applied attachments are available to perform extra operations and reduce handling, thus speeding production.

● **AUTOMATIC MECHANICAL STOP.** Stops machine at end of each cycle if operator has not unloaded and reloaded in the proper operation of machine. This and other safety features make for least loss due to damage, and for greatest safety.

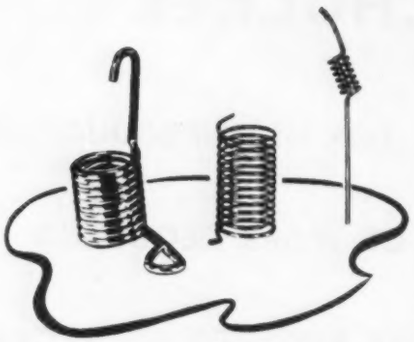
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Fatigue Cracks

By Charles T. Post

Short Measure

For better than a month now we have been pondering the matter of the remarkable Amateur Athletic Union track meet held in Washington, where records fell like clay pigeons at skeet. Had the track meet been held in any other city in the country, it would have been laughed off as a joke, but in Washington it could have a lasting effect on the tender minds of those who guide the nation's destiny.

The difficulty all traced back to the man who marked off the various distances with a steel tape. Without his knowledge, someone had borrowed the tape and had broken it. Rather than own up to his sin, the stealthy borrower repaired the tape, leaving out about 6 ft. This threw out all measurements for races longer than 100 yd.

Consider the brief thrill experienced by the runner who thought he had run a mile in the fantastic time of 4:01.6 and the winner of the 2-mile race in 8:27.4. Then think of the psychological letdown when it turned out that the mile was an abridgment, actually 69.3 yd short, with the 2-mile in proportion.

To compound the crime, according to some of the newspapers, the stop watches used in timing were running fast. "They can't even give you the right time in Washington," one reporter cracked.

We've been saving this little item, because we felt sure there must be a moral to it. Some papers would have run a venemous editorial entitled "Short Measure in the Nation's Capital" and tacked it to anything from government extravagance to the tax situation. About the best we could think of was the old standby about the race not always being to the swift, which wouldn't be entirely accurate. Anyhow the feeling of the runners after the errors were discovered must have compared to that of many common citizens when they found out the A-bomb was no monopoly.

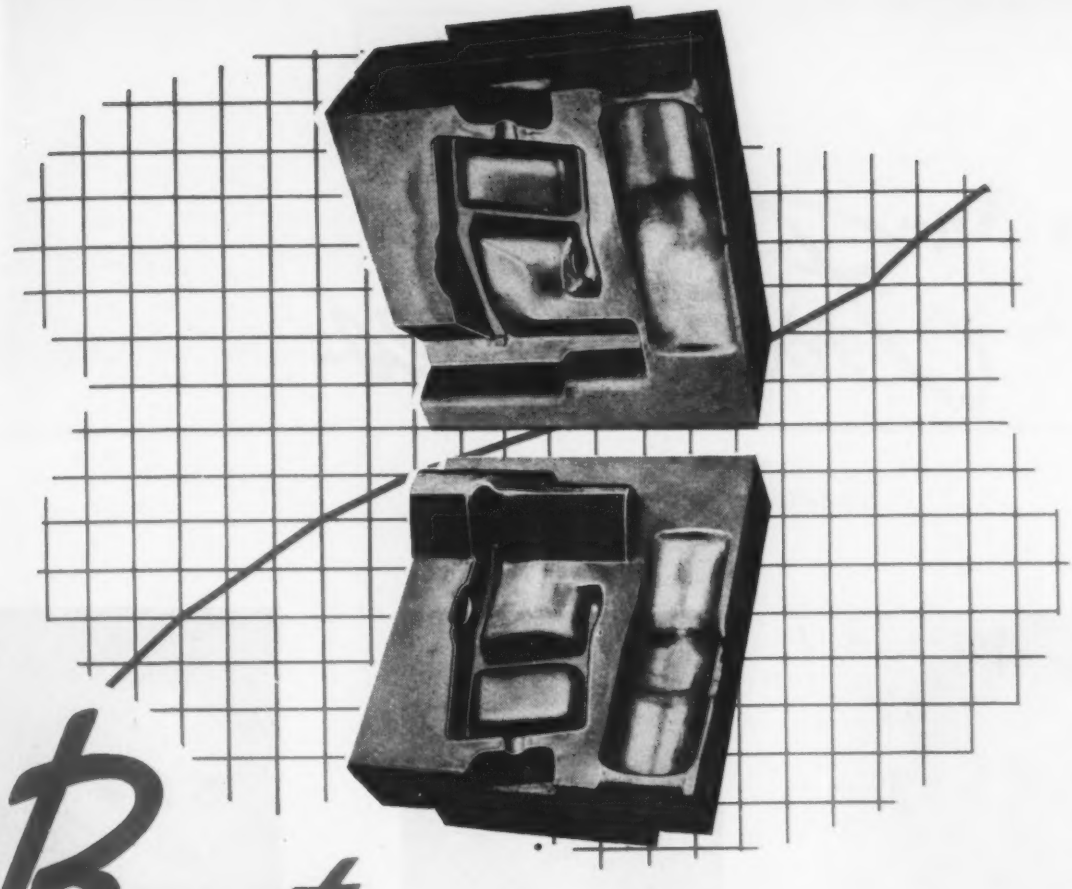
Puzzler

We knew by the letterheads that the best brains of some of America's biggest companies were at work on the puzzlers, but we couldn't figure out why so many of the answers were in longhand. A letter from a city which we shall not reveal cleared up the point last week: "Can't let my secretary know I'm wasting time working puzzles—hence the scribble. Please pardon it."

Early returns on the rod problem (If a rod of steel weighing 60 lb be drawn out 3 ft longer, it will weigh 1 lb less per lineal foot. How long is it?) show that Edgar L. White, foundry engineer, James B. Clow & Sons, Coshocton, Ohio; J. L. Vaupel, manager, Phoenix Bridge Co., Boston; and H. Kelsea Moore, Eaton & Howard, Boston, correctly calculated the original length as 12 ft or the final length as 15 ft.

It's still too early to hear from the decoders of the telegrams in which two amounts of money were represented by the symbols "$SEND," "$MORE," and the total as "$MONEY," with each code letter representing a given digit from 0 to 9. After clearing our desk and locking our door for an hour, we came to the conclusion that the two amounts were $9567 and $1085, with the total being $10,652, which agrees with the

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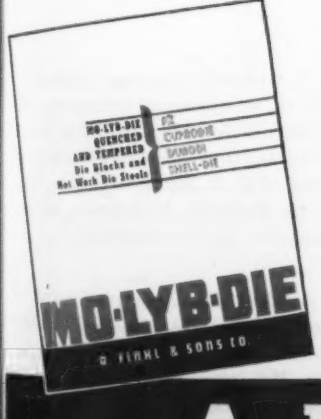


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Iron Age *Introduces*



ALBERT T. LAWSON, vice president of general services, Jones & Laughlin Steel Corp.



JOHN F. BENJAMIN, vice president, Warren Foundry & Pipe Corp.



JOHN J. KENNEDY, JR., assistant treasurer, Continental Can Co.

Albert T. Lawson was elected to the newly-created position of vice president of general services for the JONES & LAUGHLIN STEEL CORP. Mr. Lawson joined Jones & Laughlin in 1915. **L. A. Lambing** was appointed to the position of general superintendent of the Pittsburgh Works, succeeding Mr. Lawson.

John L. McGara received the appointment as general manager, Pittsburgh district, of the H. K. PORTER CO., INC., Pittsburgh. He will have charge of sales and operations of the three plants in that district.

Malcolm W. Valentine, with HUNT-SPILLER MFG. CORP., Boston, since 1915, has been named superintendent of inspection and quality control.

John F. Benjamin has been elected a vice president of the WARREN FOUNDRY & PIPE CORP., with plants in Phillipsburg, N. J., and Everett, Mass. Mr. Benjamin was formerly general sales manager of the corporation and will continue in charge of sales in his new executive position.

Sidney Gilbert was elected vice president of the NORRY ELECTRIC CORP., Rochester. N. Y., which operates the ELECTRIC EQUIPMENT CO.

Donald W. Berry was made a senior engineer in the recently organized synthetic fuels and chemicals department of BLAW-KNOX CO., Pittsburgh. Mr. Berry came to the company late in 1948 after 10 years of technical experience in chemical processing.

John J. Kennedy, Jr. was appointed to the post of assistant treasurer for CONTINENTAL CAN CO., New York. Mr. Kennedy, formerly on the investment staff of J. P. Morgan & Co., Inc., reports to Sherlock McKewen, secretary-treasurer of Continental.

Carl A. Day was appointed head of manufacturing at BAUSCH & LOMB OPTICAL CO., Rochester, N. Y. An engineer, Mr. Day joined the company in 1931 upon graduating from Annapolis. In 1942 he was transferred from the firm's instrument sales division to the manufacturing division.

J. F. Scroggins, former executive vice president, has been elected president of the DECATUR IRON & STEEL CO., INC., Decatur, Ala.



J. M. SPANGLER, president, National Carbon division, Union Carbide and Carbon Corp.

J. M. Spangler, former director, vice president and general manager of the National Carbon division of UNION CARBIDE AND CARBON CORP., New York, has been appointed president of the division after 35 years of service.

John Wesley Hanes, former Under-Secretary of the Treasury, has been elected a vice president and director of OLIN INDUSTRIES, INC., and appointed to the executive committee of that corporation.

J. Ralph Macon recently joined the PENNSYLVANIA SALT MFG. CO., Philadelphia, as an engineer in the market research division. Mr. Macon was formerly associated with du Pont's electro-chemicals department.

Turn to Page 126

Iron Age *Salutes*

HANS ERNST

He worked his trade—
With things he made
He won the big acclaim.

He reached the top
Without a stop—
Stayed human with his fame.



HANS ERNST was recently honored as the outstanding engineer of the year in an engineering city—Cincinnati. A citation in the form of a scroll was presented to him at the Annual Joint Technical & Scientific Societies meeting at the Taft Auditorium. His name is being inscribed on a bronze plaque to be placed in the Engineering Society headquarters.

These are high honors received in competition with a large field of outstanding men. That Hans Ernst was selected by the board of judges is not happenstance. It is recognition for tireless and fruitful work spaning a career that dates back farther than Hans likes to recall.

Hans is really an immigrant. He was born in Melbourne, Australia, and graduated from the Melbourne Technical College in 1911. After 4 years of engineering design and teaching experience he came to the United States in 1915.

He was associated for 8 years with Western Cartridge Co. of Alton, Ill., in research and machine development work. For the past 24 years he has been in charge of research and development work for the Cincinnati Milling Machine Co. as director of research.

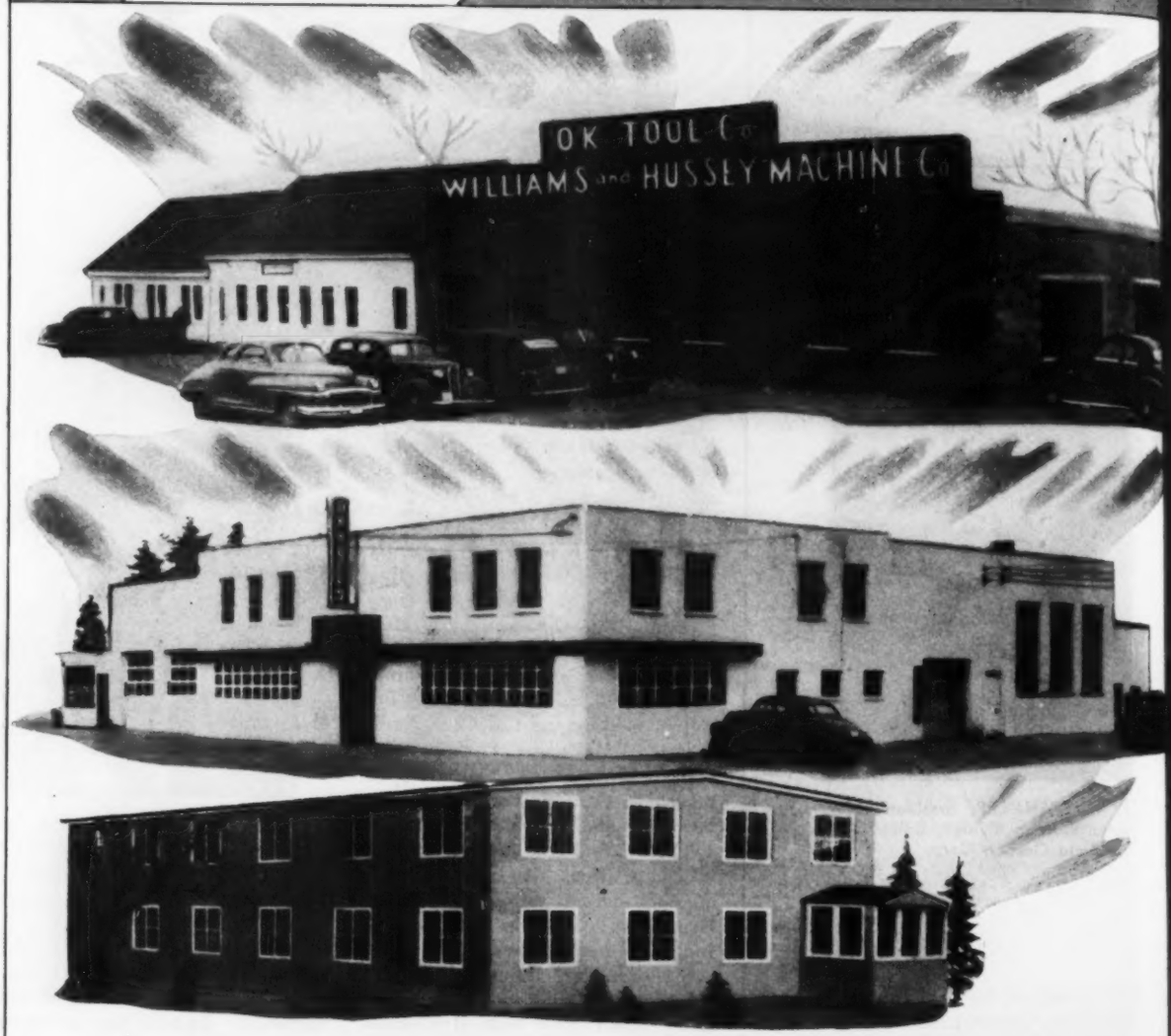
His work in metal cutting has become recognized internationally, and he is the author of many booklets and papers in the field. His paper, "Physics of Metal Cutting," is regarded by many as the bible of metal cutting research. He has spoken on the machinability of metals before numerous technical societies. And he has contributed many articles to engineering and scientific journals, including THE IRON AGE.

His present citation is for "his outstanding contributions to the field of engineering, his contribution to the development and well-being of the profession and his contribution to human welfare.

"His creative genius uncovered the deepest mysteries of metal cutting. . . . He has not only contributed to the advancement of science and engineering but he has added to the stature of these professions because of his likable personality, his high ideals and his professional ethics."

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condition of condenser and heat exchanger service·

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GLOBAL LETTER

REVIEW OF WORLD MARKETS

Orders drop for British shipbuilders . . . West German embargo on steel and iron hurts Soviet Sector . . . Canada releases scrap steel from price control.

London—Britain's shipbuilding boom is over. This fact is causing considerable thought and not a little controversy among British shipbuilders.

In 1949 the U.K.'s shipbuilding yards produced 1,400,000 gross tons of new merchant ships, the highest since the war. Of this amount 70 pct was produced for home use and the remainder for export. The value of this output is estimated at $332 million, so that direct export of new ships earned $96.6 million in foreign exchange.

Backlog Falling Off

The backlog of orders now stands at 3.25 million gross tons which means that many yards will continue to be busy in 1950 and, in some cases, for a longer period. However, the long-term outlook is not favorable. New orders in 1949 totaled 400,000 gross tons, less than one-third of the year's output of completed ships.

H. B. R. Powell, chairman of the shipbuilders' organization, says that in the next 18 to 24 months readjustment to normal conditions must be speeded up. If costs are to be cut and efficiency increased, the volume of new orders must be increased. High costs are blamed for drying up the flow of orders, but quicker delivery may encourage shipowners to undertake their necessary replacements.

Cost Reduction Difficult

British shipbuilders are exerting every effort to reduce costs within their control. Their task is made particularly difficult because the domestic price level for raw materials, equipment and goods and services of all kinds, show no signs of falling. The increased cost of coal, gas, electricity and shipping are all adverse factors in decreasing the cost of ships.

Another leading industry spokesman, J. Ramsay Gebbie, says that after 10 years of more or less sheltered conditions, British shipbuilders are now exposed to the full blast of world competition. They must compete with the rest of the world in delivery time, prices and general conditions. They must forget the exceptional and temporary conditions of the past decade and face the readjustment to normal and highly competitive times. Readjustment should be gradual because of the large backlog of orders. However, the realistic viewpoint of employers, government spokesmen and trade union leaders is to urge those who do not normally work in the shipbuilding industry and cannot find employment there to find employment in other industries where manpower is needed.

Fear Foreign Competition

Charles Connell, president of the Clyde Shipbuilders' Assn., is concerned about ex-enemy competition. Decisions about the amount of shipbuilding to be permitted in Germany and Japan seem to have been lifted from the industrial to the political level, he says. It is with serious misgivings that the shipbuilders see the permitted level of maritime industries in ex-enemy countries being increased at a time when world capacity exceeds any normal demand. When it is remembered that expansion, brought about by aggressive wars waged by these countries, has left the British shipbuilding industry with grave social and economic problems, twice in one generation.

German Governments Meet To Discuss Trade Agreements

Berlin—In an attempt to settle some of their economic differences the East and West German governments opened negotiations last week.

The talks were proposed by East Germany which wants West Germany to lift its embargo on iron and steel shipments. The embargo was enforced recently when East

Turn to Page 161

Rotary Swaging Gains Favor as Faster, Better Way to Shape Metal

Increasing numbers of metal working plants are adopting rotary swaging for tapering, forming, reducing and assembly operations because of large savings in time, labor and materials as well as important improvements in the physical properties of the metal being worked.

Saves Time and Labor With No Loss of Material

Rotary swaging is a forging process in which tubular or solid bar stock is shaped by means of repeated blows applied by rotating dies. The process develops cylindrical, conical, "necked" and other special shapes *with no waste of material.*

Most swaging operations require only a few seconds. Even on difficult work, the length of time required is much less than that needed to secure equal results by other processes. So simple to use that highly skilled operators are not required.

Other Important Benefits From Swaging

Like forging, swaging improves the grain structure, hardens the material and gives it increased elasticity and tensile strength. The hammering action imparts a high finish to the surface which in most cases need not be given further treatment. A high degree of accuracy is possible. Close tolerances can be held. Tubular parts often develop enough wall thickness to permit threading.



← Fenn-Standard Rotary Swagers are available to handle work as small as .015" to .020" diameter, solid bar stock up to 3¾" diameter and tubular stock up to 6" diameter. Machines with larger capacities can be designed and built to order.

Plant Replaces 5 Rolling Mills With One Tandem Turks Head, Cuts Costs

The high speed and versatility of tandem Turks Heads has enabled many manufacturers to secure remarkable production economies by using them in place of older style equipment.

One manufacturer has replaced five rolling mills with one tandem Turks Head — at comfortable cost savings and with no loss of productive capacity. Others have been able to reduce costly inventory to a minimum number of finished stock sizes because their Fenn-Standard tandem Turks Heads allow them to fill job lot orders more quickly than ever before.

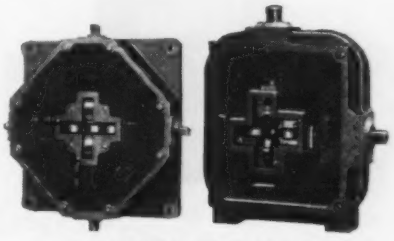
From round wire to finished shape in one pass through tandem Turks Heads has opened up an efficient, low-cost way to form wire and edge strip stock for increasing numbers of manufacturers.

Operation of these machines is fast and simple. The heads can be changed in ten minutes — the work turned out in little time. Fewer sizes of starting rounds are needed — less raw stock is used — waste is cut to the vanishing point — inventory problems are minimized.

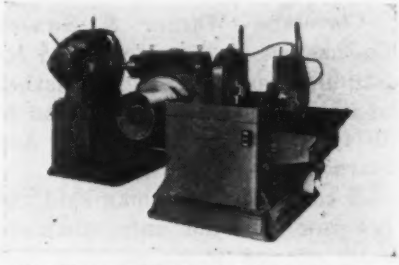
Turks Heads Use No Dies

The work is *rolled* to shape, giving the added benefits of improved metal structure, greater tensile strength, greater accuracy and higher production rates as compared with dies.

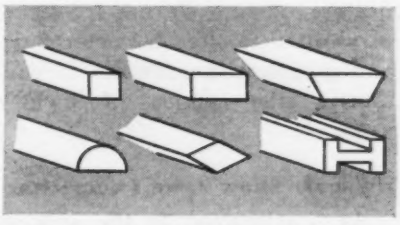
For rectangular sections, short runs and light reductions, Fenn-Standard Universal Type Turks Heads are used. For forming rectangles and special shapes, with long runs and heavy reductions, Plain Type Turks Heads are specified. Material is rolled on both vertical and horizontal planes simultaneously. Close tolerances are maintained.



Left: Plain Type Turks Head.
Right: Universal Type Turks Head.



Fenn-Standard Tandem Turks Head. Handles all round wire in size range .40" to 1.250".



Some cross-sectional shapes obtainable with Fenn-Standard Turks Heads.

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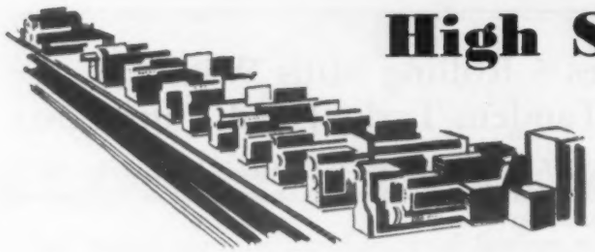
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Sales Inquiries and Production



Warner & Swasey Co. sets up trade-in and rebuilding program . . . Chrysler work progresses on V-8 engine.

by William A. Lloyd

Cleveland—Warner & Swasey Co. has set up a trade-in and rebuilding program for turret lathes of its own make, manufactured in 1934 or later, THE IRON AGE learned this week.

A company spokesman said the program will not only stimulate sales of new machines, but will enable the company to meet the competition of used machinery dealers. It puts Warner & Swasey in position to offer factory-rebuilt and guaranteed machines to customers who cannot afford new ones.

Records Show True Competitor

As a stimulant to the sale of new machines, the company is prepared to offer a trade-in allowance on any Warner & Swasey turret lathe of 1934 or later. For the user who is planning to rebuild, rather than buy a new machine, the trade-in allowance plus the cost of rebuilding is expected to amount—in many cases—to 80 pct of the price of a new machine. The allowance will vary with the machine.

A company spokesman said Warner & Swasey may possibly go into the used market and buy some of its own machines during the initial phase of the program.

"Our sales records show that our real competition is the used machinery dealer," he said. "By offering factory-rebuilt machines, we will be able to meet this competition."

The company is in the process of rebuilding about 20 turret lathes at the present time. A separate department for receiving and dismantling has been set up. After cleaning, dismantling, and inspection the machines are sent through the regular assembly departments.

The company has no plans for a similar program for tappers, automatics and its other machinery.

A. H. Keetch is in charge of the program, which is only in part a resumption of Warner & Swasey prewar trade-in and rebuilding policy.

Machine Tool Orders Hold Up

Elsewhere, spokesmen for major segments of the industry reported January new order volume the highest of any month since the fall of 1946. February orders, it is understood, are continuing on the January level, indicating that the machine tool industry may be in for a big first half.

In Detroit the machine tool industry, with very few exceptions, is extremely active. Chrysler work on a new V-8 engine is progressing, despite the strike.

In addition to its six-cylinder engine to be built in Cleveland, Ford is progressing on a new high compression V-8 scheduled for the Rouge. Requests for quotations are expected momentarily on this job.

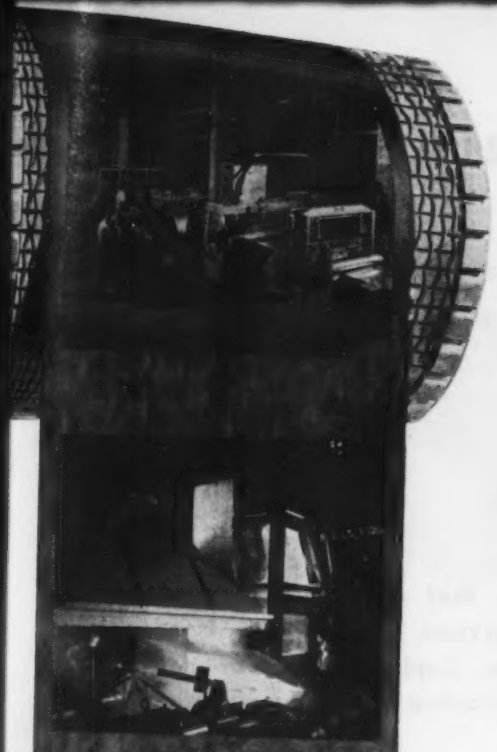
The second area of feverish activity is in automatic transmissions and here Ford and General Motors are moving rapidly. Placements for the new Ford transmission plant at Cincinnati are going forward, aimed at pilot production early in April. Tooling required for the new GM transmission plant on Plymouth Road has been extensive and this program is going forward at a lively pace, according to trade sources.

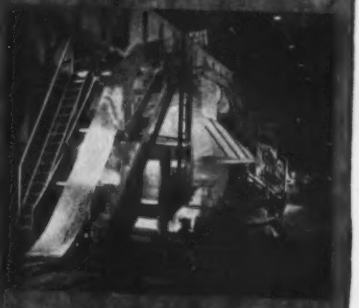
There has also been some tool room equipment for both new engine and transmission jobs, but traditionally such equipment follows rather than leads a major machine tool program.

ECA Aids French Recovery Plan

In Washington, approval of an industrial recovery project for France for machine tools and industrial equipment has been announced by the Economic Cooperation Administration. The project involves purchase of machine tools and related equipment by Schneider & Co., a major producer and fabricator of steel. The company has undertaken a two-year large scale program involving three billion francs. Machinery and equipment will be purchased in the U. S. with $1,930,000 in ECA funds, of which about $1,732,000 will be spent for machine tools and accessories and $198,000 for metalworking and industrial machinery.

Cost of installing the machine tools and industrial equipment is estimated at the equivalent of $860,000, and cost of the total modernization program by Schneider & Co. is estimated at the equivalent of $8,600,000. Most of the franc financing is expected to come from resources of the company.





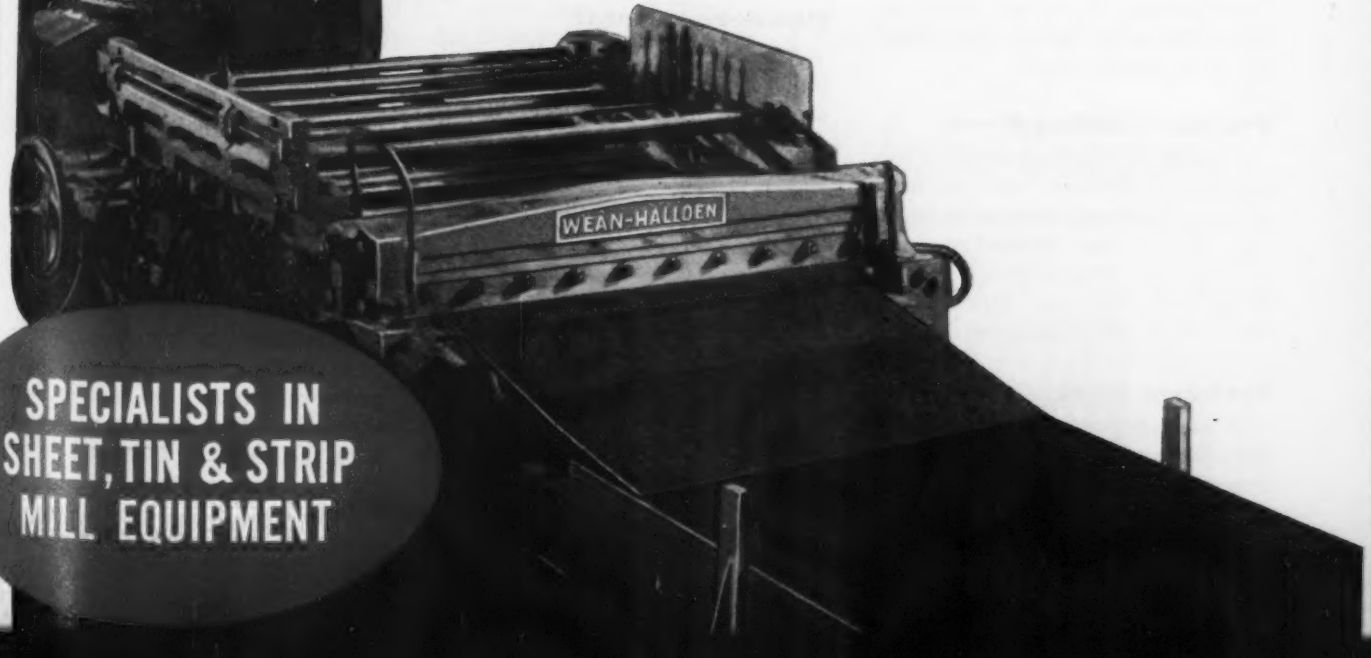


The WEAN ENGINEERING Company, Inc.

WARREN, OHIO

The WEAN Economy Line

THESE illustrations show a Wean continuous hot dip galvanizing line for the production of galvanized sheets, either plain or for corrugating purposes.



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PUBLICATIONS

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Alligator Shears

Descriptions of the line of Canton alligator shears, embodying several exclusive features, are given in an illustrated 32-p. catalog, which also presents instructions for lubricating, adjusting and erecting the equipment. *Canton Div., Hill Acme Co. For more information, check No. 1 on the postcard.*

Bronze Bars

Sizes, weights and physical properties of Tiger bronze cast or machined, cored or solid bars are listed in a 6-p. bulletin describing uses of this wear and shock resistant, anti-frictional material. *National Bearing Div., American Brake Shoe Co. For more information, check No. 2 on the postcard.*

Staplers and Tackers

The line of Duo-Fast gun or compression, hammer, strike and air tackers are described and pictured in a 26-p. catalog listing a number of uses for staple fastening in numerous industries. *Fastener Corp. For more informaton, check No. 3 on the postcard.*

Plastic Molding Press

Presses for the compression molding of plastics to suit any need are described and illustrated in an 8-p. booklet on production and laboratory presses. *Williams, White & Co. For more information, check No. 4 on the postcard.*

Stainless Steel

A 12-p. booklet, entitled "Stainless Steel and Textiles," explains how stainless steel can be used to reduce costs and improve product quality, and includes service records 10 to 15 years old to show the value of stainless equipment installations for the textile industry. *Armco Steel Corp. For more information, check No. 5 on the postcard.*

Fastening Equipment

The Ramset fastening system, providing a fast and cheap replacement for drilling and tapping into structural steel, is described in a 4-p. folder giving specifications and illustrations of Ramset fasteners. *Stemco Corp. For more information, check No. 6 on the postcard.*

Powdered Metal

Advantages of Wel-Met self-lubricating cylindrical bearings are given in a 4-p. folder listing stock sizes, along with bearing material and other powdered metal parts. *Wel-Met Co. For more information, check No. 7 on the postcard.*

Alloy Data Sheets

Chemical composition, essential mechanical and physical properties, heat treatment and other detailed information on 80 alloys, both ferrous and nonferrous, for the production of small or intricate parts, is presented in an 8-p. manual of data sheets. *Precision Metalsmiths, Inc. For more information, check No. 8 on the postcard.*

Heavy Duty Forgings

Numerous illustrations of steps in the production of Finkl Mo-Lyb-Die processed forgings for heavy duty use are presented and described in a new 16-p. booklet on forging manufacture. *A. Finkl & Sons Co. For more information, check No. 9 on the postcard.*

Hydraulic Presses

Elmes standard single, double and triple action hydraulic presses for drawing, forming, coining, forcing, forging, reducing, bending, straightening and ironing, as well as presses for special metalworking needs are shown in a 12-p. catalog giving specifications. *Elmes Engineering Works of American Steel Foundries. For more information, check No. 10 on the postcard.*

Seamless Cylinders

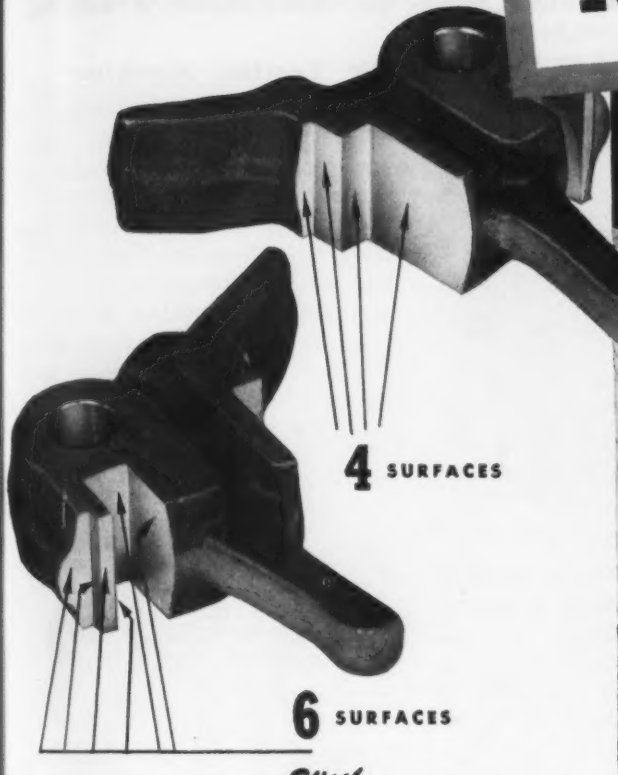
Operations in the manufacture of Harrisburg seamless steel high-pressure cylinders are described and shown in a 22-p. booklet, which also lists the variety of capacities and

Turn to Page 135

GANG-MILL

10 SURFACES AT ONE TIME!

1500 PIECES PER SHARPENING





With

BARBER-COLMAN

CARBIDE-TIPPED GANG CUTTERS

A good way to beat today's high costs of production is to combine several operations into one. This job is a good example. 10 different dimensions are machined on tough steel forgings, 4 pieces per load, in 4 minutes, using Barber-Colman special carbide-tipped gang cutters.

Rigid workpiece and cutter mounting permits a fast feed of 11" per minute and 187 cutter r.p.m. — with no sacrifice in tool life. An average of 1500 parts are machined per gang sharpening.

Check your milling operations for possible combination cuts, and then let a Barber-Colman Cutter Engineer recommend the best tools for the job.

JOB FACTS

Operation — Gang-Mill Pressure Levers, 10 Surfaces
Material — SAE 4615 Forgings, 180 Br.
Cutters — B-C Job-Engineered Half-Side Mills and Full-Side Mills, Carbide-Tipped, Negative Rake
Feed — 11"/minute, climb cut
Speed — 187 RPM
Fl-to-Fl — 4 minutes per load
Tool Life — 1500 pieces per gang sharpening

METHODS ENGINEERS!
Get this Special File of typical performance on Job-Engineered Cutter Designs. Write for File No. 8908.



Barber-Colman Company

GENERAL OFFICES AND PLANT, 8908 LOOMIS ST., ROCKFORD, ILLINOIS, U. S. A.

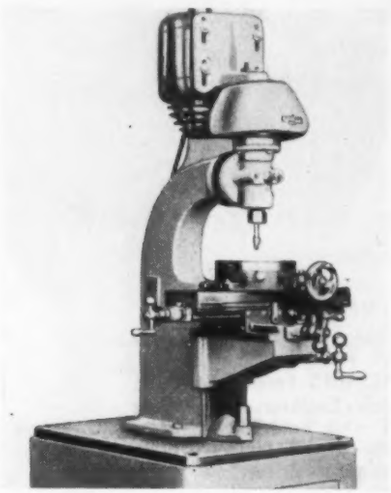


BARBER COLMAN

resistance, the immersion time should be 2 min. Tests to determine the paint base characteristics of the coating indicate excellent adherence for the paint to the metal. *Allied Research Products, Inc. For more information, check No.* 29 *on the postcard on p.* 35.

Milling Machine

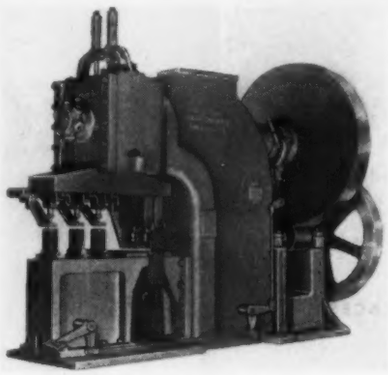
A low-priced vertical milling machine with an adjustable head is precision machined to hold tolerances up to 0.001 in. Milling, drilling, boring, and routing can be done at any angle as the adjust-



able swivel head will turn on a 180° radius. The spindle is equipped with tapered Timken bearings maintaining spindle alignment and carrying radial and thrust loads, transmitting smooth maximum power to the cutter at any angle. A wide variety of spindle speeds and ease of setup make it adaptable to production and maintenance jobs. *Columbia Enterprises, Inc. For more information, check No.* 30 *on the postcard on p.* 35.

Universal Punch

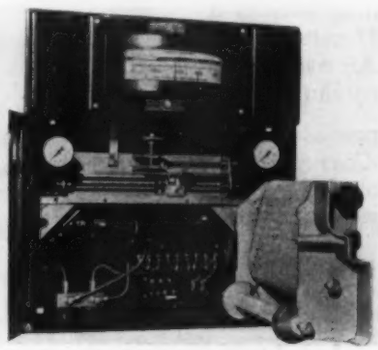
For use in structural steel and fabricating shops, an improved universal type punch has a rated ram pressure of 235 tons, a 2¼-in. stroke, and a throat depth of 28½ in. A 2½-in. hole can be punched through 1-¼-in. mild steel. Equipment includes two low die holders, three high die holders, and two



goose-neck die holders, together with necessary punching equipment to suit the die holders. The machine can handle 3-in. I beams to 36-in. H beams, and is capable of handling a broad range of flange punching without changing setups. Both flange and web punching can be done without setup changes. *Kling Bros. Engineering Works. For more information, check No.* 31 *on the postcard on p.* 35.

Chart Recorder

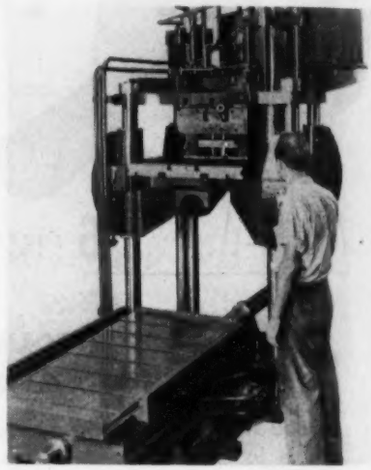
With the new air-operated strip chart recorder, temperature, speed, flow, pressure, static grain loads,



ac and/or dc volts, amperes, etc., can be measured with the flexibility, accuracy and simplicity of the Wheelco Capacilog electrical system. The control function is performed by the smooth floating power of air, via the Wheelco Electronic Link, operating diaphragm motors connected to valves, dampers, levers, and pistons. The instrument is known as the Pneumatic Capacilog. *Wheelco Instrument Co. For more information, check No.* 32 *on the postcard on p.* 35.

Die Testing Machine

Perfect die matching is said to be possible with a new die testing machine. The machine opens and closes dies with such accuracy that the parting line can be matched perfectly before the die leaves the tool room. In operation two halves of the die are clamped to the two machine platens. The bottom platen moves down and then moves horizontally, bringing the die at a convenient working height and out in



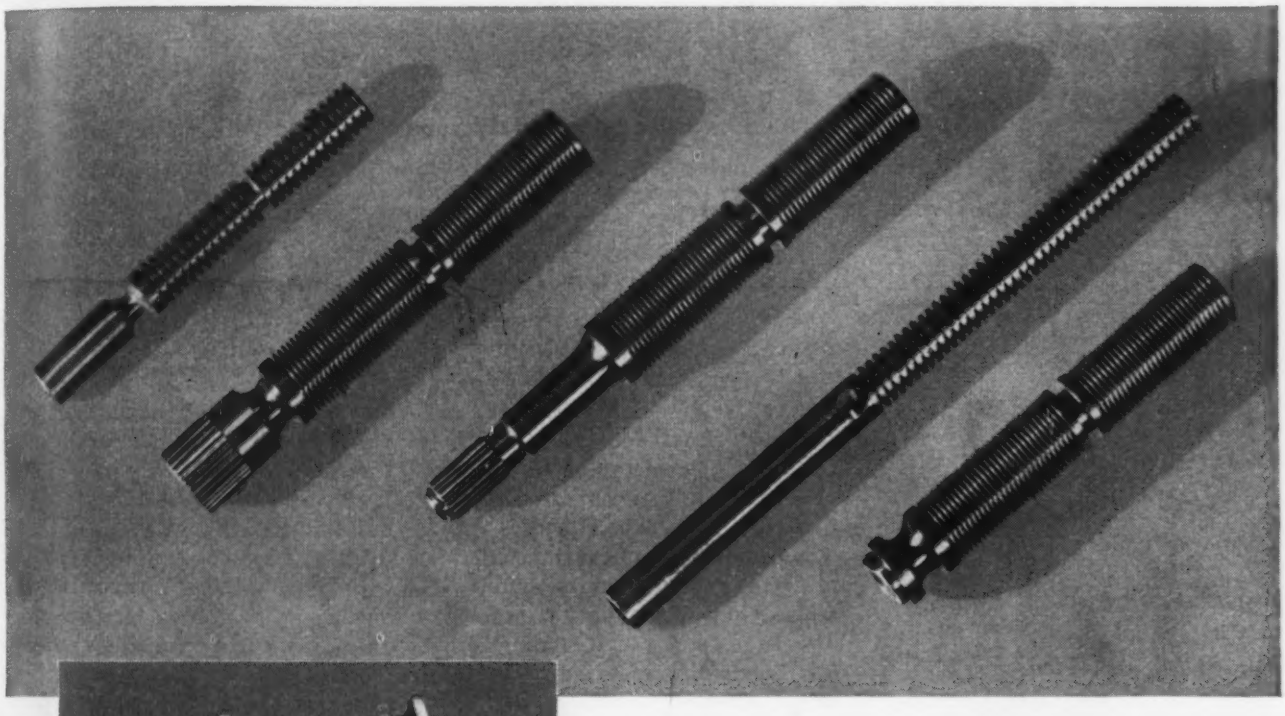
the open. After being worked on, it can then be quickly moved in and up, in perfect alignment for checking. Oil cylinders are located inside two of the vertical columns. Vertical travel is 36 in., yet the machine will fit under a 10-ft ceiling. *Lester Engineering Co. For more information, check No.* 33 *on the postcard on p.* 35.

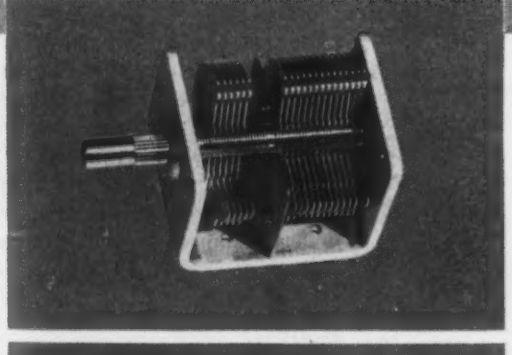
Multiple Drill Head

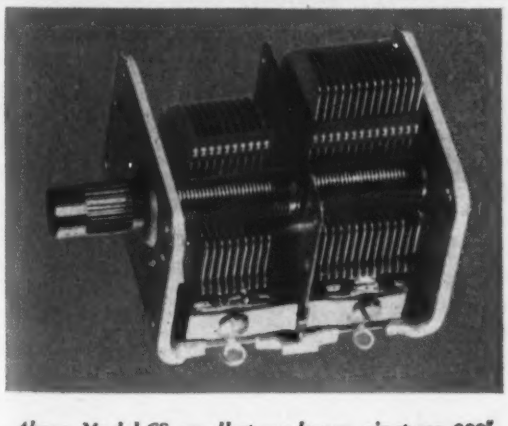
Flexibility in drilling or tapping parts with hole sizes up to 5/16 in. in steel is possible using a new convertible multiple head with adjustable spindles. Rapid and accurate spindle adjustments can be made from a minimum center distance of 1 1/16 in. to a maximum

Turn to Page 137

For Tough Machining Jobs, Get REVERE FREE-CUTTING BRASS







Above, Model CS, smallest condenser, air space .009". Below, Model B, largest, air space .013". Rotor shafts, shown in top illustration, are Revere Free-Cutting Brass, plates aluminum. Made by The American Steel Package Co., Defiance, Ohio, an important supplier to the electronics industry.

HERE are several examples of the fact that Revere Free-Cutting Brass is really good. These rotor shafts for variable condensers are cut on automatic machines at 3600 r.p.m. Circular tools are used to cut the concentric slots which are .050" deep. Only one cut has to be taken. Approximately 425 pieces are produced per hour on a 6-second cycle. The American Steel Package Company, Defiance, Ohio, produces a number of different condenser models, with air spacing ranging from .009" up to .042". The slots in the shaft of Revere Free-Cutting Brass are all of the same width, regardless of air spacing, namely .014" plus or minus .0002". It takes good machines, good tools, good men, and good metal to work that closely. A report from a Revere Technical Advisor who had collaborated with the company states: "Customer is outstanding in his praise of Revere Rod." . . . If you have a problem in the machining of brass, why not give Revere an opportunity to work with you? The Revere Technical Advisory Service is at your command.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.
Sales Offices in Principal Cities, Distributors Everywhere.

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

U. S. Rubber introduces new nylon safety tube . . . Ford opens its research center . . . Auto market continues to look good to the industry . . . . Olds hits peak output.



by Walter G. Patton

Detroit—U. S. Rubber Co. engineers have taken a new approach to the problem of highway safety. Instead of building a tubeless tire or a self-sealing tube, researchers at U. S. Rubber have developed a new inner tube made with nylon cord that is so strong it will actually sustain the weight of a car without any assistance from the casing. This is probably the first time an automobile has ever been driven purposely any appreciable distance on the inner tubes.

The new U. S. Royal Nylon Life-Tube is reinforced with two plys of nylon cord. Synthetic rubber which gives maximum protection against air leakage is used on the inside and natural rubber on the outside of the tube.

For all practical purposes, the new tube gives eight-ply safety to four-ply tires, according to Dr. A. W. Bull, director of U. S. tire development. In event of a puncture, the nylon tube squeezes rubber around the puncturing object, preventing sudden flats and permitting only a slow leakage of air. The tube is not self-sealing but can be readily repaired at a tire shop.

Special Flap Fits Against Rim

A car equipped with new tubes and without tires has been run for miles without failure or loss of air. In another test a tire, deliberately gashed and with the tube exposed to the road, was run for 150 miles without failure of the tube. U. S. Rubber engineers claim the new nylon tubes will outlast at least three normal casings.

A special flap is built into the new tubes which fits against the wheel rim. According to U. S. Rubber engineers, this prevents overstressing of the tube, adding greatly to its life. The new tubes are being produced at the rate of 300 or 350 per day in the popular tire sizes. A. N. Iknoyan was the development engineer on the new project.

Ford Engine Laboratory Opened

The first wing of Ford's new engine laboratory was officially opened recently. The new laboratory is located on Village Road just west of Dearborn Inn on a 500-acre tract set aside for the new Ford Research Engineering Center buildings.

The complete engine building will house 38 test rooms, including 32 engine and two transmission units, 1 carburetor flow stand room, 2 vehicle test rooms and 1 axle test room. The central part of the building will house the administrative and engineering offices.

The Ford Research Center has been developed under the direction of Harold T. Youngren, vice president, engineering. The center is named in honor of Henry Ford, founder, and Edsel B. Ford, father of Henry Ford II.

Dynamometer Acts as Brake

In the present wing there are 15 sound proofed test rooms equipped with 200 hp General Electric amplidyne direct current dynamometers. There is also a 250 hp dynamometer and a 600 hp induction type dynamometer used for transmission and torque converter development.

When the engines are running under their own power, the dynamometer acts as a brake and records the performance. When the dynamometer is reversed and run as a motor, it measures the friction of the engine.

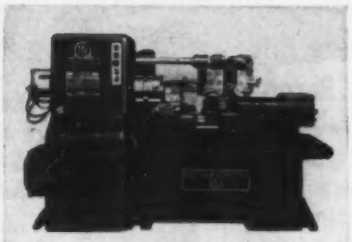
Each test room has an electroni-

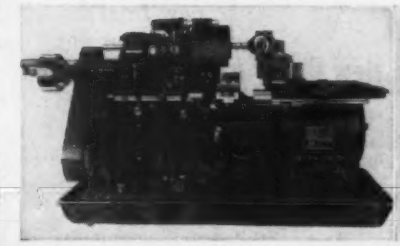
FOR TODAY'S ALL-IMPORTANT NEED:

Productivity with Economy

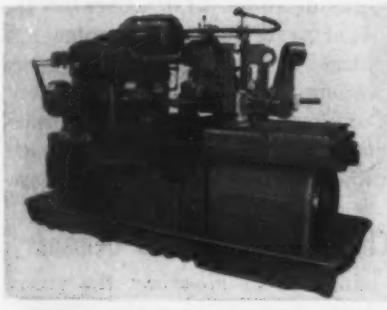
P&J TOOLING ON AUTOMATICS

3U Speed-Flex
Newest P&J development—a small high speed machine for machining castings and forgings up to 6" diameter, 4" long — spindle speeds up to 1445 R.P.M.



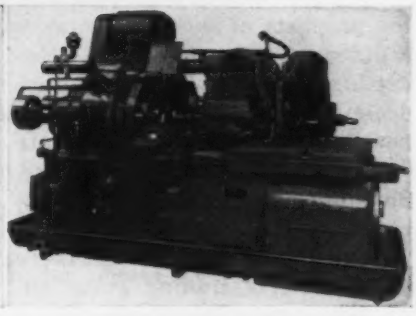


4D Automatics
Made in two sizes (standard and elevated) with spindle speeds up to 696 R.P.M.—suitable for machining castings and forgings up to approximately 10 inch diameter.

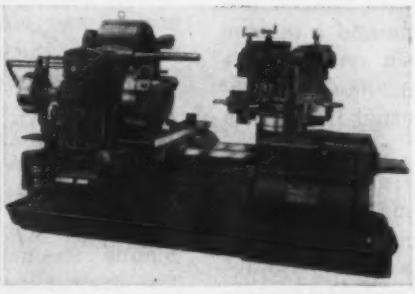


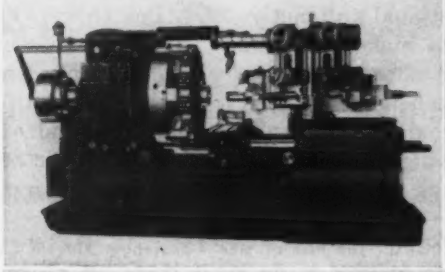
5D Power-Flex
Built in three sizes (standard, elevated and elevated with long travel). Suitable for work up to about 14" diameter with spindle speeds up to 610 R.P.M.

5D-2 Power-Flex
Two spindle machines built in three sizes capable of high production machining of work up to 7", 10" and 13" diameters respectively.

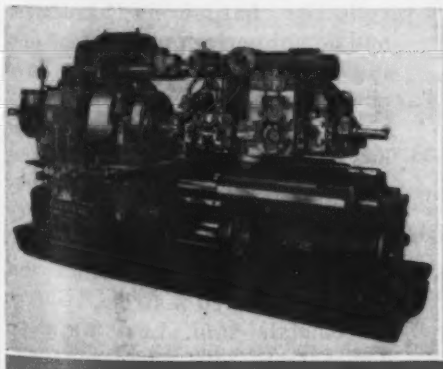


6D Automatics
Available in three sizes and combinations of swings, travels and bed lengths . . . suitable for machining castings and forgings up to 18" diameter and 20" long.





6-DS Automatics
Heavy duty powerful machines (two sizes) for large castings and forgings . . . headstock capable of handling 60 H.P. swings over cross slide 21" (6-DS) and 27" (6-DSE) 13" turret feed.



8-DT Automatics
Equipped with special heavy duty cross slide . . . 60 H.P. headstock . . . swing over cross slide 23" . . . turret feed 16" . . . for large castings and forgings.

Potter & Johnston Company
Pawtucket, R. I.
subsidiary of Pratt & Whitney
Division Niles-Bement-Pond Company

P&J AUTOMATIC TURRET LATHES

cally operated control panel. A safety button on the control panel enables the operator to shut off the test instantly. A duplicate safety button also enables the engineer on duty in the corridor to stop the test in case of an emergency.

Overall size of the completed cross shaped engine test building will be 450 ft x 430 ft. In the new Ford Dynamometer building, all of the electric needs of the building will be recovered from the 32 dynamometers. The building was designed by Vorheis, Walker, Foley & Smith, New York City architects and engineers, working with Ford engineers.

Demand Continues for New Cars

During the postwar period, February has been a month of uncertainty in the automobile industry. A year ago stories were rampant about dealers' showrooms being flooded with unsold cars. This year the prophets of doom have taken a different tack. Wholesale price cutting, they cry, is raging. Auto dealers are "horse trading" like never before. The car makers are being forced to reduce base prices. Simultaneously, dealers are increasing their trade-in allowances.

There can be no doubt that there is some horse trading going on. At the same time it should be pointed out that this is not a true picture of the national automotive scene. The auto makers not on strike are going ahead with the most ambitious schedules in their history. If the coal strike results in steel mill closings it will head off these ambitious schedules. But nothing short of this will change these schedules.

Automobile executives continue to insist that the market for new cars is excellent. Despite wailings by auto dealers at Atlantic City recently—against bootlegging, too many cars to sell, lowered discounts on automatic transmissions, time-sales financing regulations, federal excise taxes, etc.—the automobile industry is going ahead with its original plans.

Olds Assembly Plant Hits Top Production in Record Time

Less than nine weeks after the new final assembly plant at Lansing went into operation, Oldsmobile hit a production goal of 80 cars per hour. The plant was designed for an output of 80 cars per hour but automotive experience has shown that few companies reach capacity in a new assembly plant before several months of operation.

According to Oldsmobile officials, cross-transfer conveyors that move cars automatically from one assembly line to another, floor-level belt-type conveyors, well lighted and ventilated pits for under body operations and a master control board which synchronizes conveyor operations, have contributed to the high output in the new Lansing assembly plant.

Designing, engineering and building an automatic transmission is only about half the job. The other half—and an equally important half—is training dealers to service the new devices.

Chevrolet has had the unenviable job of training 10,000 mechanics in its dealer departments to service the new Powerglide transmission. At least one mechanic from every dealership is attending a 2½ day school. Classes are limited to six men each. Each service man takes apart and puts together one of the new transmissions. The men who attend these school sessions are the men who will actually perform this job on your car, according to E. L. Harrig, manager of Chevrolet's service and mechanical department.

The Chevrolet school began Jan. 3. Sessions are expected to run through May. Most of the meetings are held in one of Chevrolet's 37 zone headquarters cities.

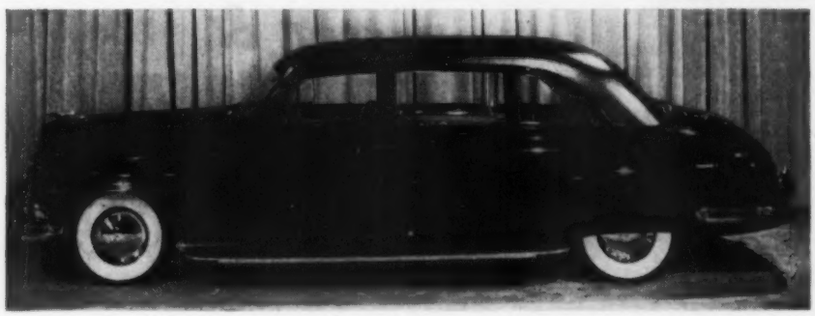
The latest Chevrolet move recalls the fact that when automatic transmissions first appeared the usual practice was to replace the entire unit and send the faulty transmission back to the factory. Confidence in automatic transmissions is undoubtedly much greater today than it was a few years ago.

Chrysler Handed New Demands

Instead of clearing, the atmosphere surrounding the Chrysler strike was clouded further this week when the union handed Chrysler a new set of demands. According to Robert W. Conder, director of labor relations of Chrysler, the United Auto Workers, CIO has only complicated the present impasse by tossing in an additional 109 demands. The new demands concern the provisions of company-union collective bargaining agreement and do not pertain to pensions and insurance, Chrysler officials have charged.

"Chrysler regrets that the Union has chosen at this time to propose discussions of entirely new subjects rather than continuing to devote its entire efforts towards settling the issues over which the Union has called a strike," Chrysler officials said. Last week, to demonstrate its determination, Chrysler strikers ringed the Jefferson plant with a car picket line. The lineup of cars, bumper to bumper, completely surrounded the plant.

PRESIDENTIAL SPECIAL: The first of nine 7-passenger Lincoln Cosmopolitan custom limousines has been delivered to the White House. It will be used by President Truman. Cosmopolitans are leased to the government under contract with Ford Motor Co.





This is no idle promise. It is a proved fact, demonstrated day after day in the production of widely varied parts and products. Three tons of N-A-X HIGH-TENSILE are yielding as many finished units as were previously yielded by *four* tons of carbon sheet steel.

This "new arithmetic in steel" is helping scores of manufacturers. They are taking advantage of N-A-X HIGH-TENSILE'S greater strength and corrosion-resistance to reduce sections an average of 25%—and still provide greater strength and durability than can be obtained with thicker sections of mild-carbon steel.

At a time when America must make full use of its steel-producing capacities and conserve its natural resources, the trend to N-A-X HIGH-TENSILE has national significance. Each ton produced represents a potential 33% increase in finished goods of superior quality. Investigate the opportunity to make each ton of sheet steel go farther—through the superior quality of N-A-X HIGH-TENSILE.

GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • ECORSE • DETROIT 29, MICHIGAN • UNIT OF NATIONAL STEEL CORPORATION



WEST COAST PROGRESS REPORT

Northwest power situation discourages aluminum industry expansion . . . Coal shortage decreases iron production.

Digest of Far West Industrial Activity



by J. Reinhardt

Portland, Ore.—Further expansion of existing primary aluminum production facilities, or operation of any other additional industries requiring large blocks of firm electric power, are definitely stymied in the Pacific Northwest until at least 1954.

This situation was confirmed last week by officials of the Bonneville Power Administration who explained that not until power plants at Hungry Horse Dam in Montana are in operation in 1952 will there be any major improvement in supply in the Northwest and even then the volume will not be sufficient to justify large commitments. All 18 generators will have been installed at Grand Coulee by the end of this year, which will bring the peak capacity of that producer to 2,160,000 kw, which will firm up some of the power now supplied on an interruptable basis. Hungry Horse power available for the Northwest grid in 1952 will be relatively small as total capacity of that unit will be 285,000 kw.

Major source of new power is McNary Dam scheduled for completion in 1957 but which will begin producing in 1954. Total power development there will be 980,000 kw.

Bonneville, with a peak capacity of 564,000 kw, is in full operation most of the time but is subject to curtailments because of occasional low water.

Power Load Increases

Last year the federal power system of the Columbia R. became the second largest producer in the country, second only to the Tennessee Valley Authority. Bonneville and Coulee dams, last fiscal year, produced 12,925,788,000 kwh which was about two-thirds of the electrical energy developed in Oregon and Washington and about one-half the production of the entire Pacific Northwest.

Growth of the power load in the Northwest is indicated in the annual report of BPA for the year ending June, 1949. The report states that 22 billion kwh were consumed that year, while in 1940 the load was about seven billion kwh. It is estimated that the load in 1958 will be approximately 47 billion kwh.

This power dearth is having its effect on several proposed electrometallurgical plants in the area and may possibly be the cause for the delay in going ahead with the exploitation of aluminum bearing laterite ores in Oregon which have been explored and experimented with by Aluminum Corp. of America.

Alcoa Maintains Production

Although Pacific Northwest Alloys recently was granted enough additional power to enable it to operate the second of its four ferrous alloy furnaces near Spokane, Wash., it is doubtful if any further expansion can take place there until the general power situation improves. Ferrochrome and ferrosilicon are now being produced.

Operation of the furnace at the Salem, Ore., plant built during the war to produce alumina and recently negotiated for by Seattle interests, has been delayed by financial difficulties. It was announced that ferromanganese would be produced there although again, power commitments were uncertain.

Aluminum Co. of America at

Hardening



Production up from 14 to 35 per hour, and savings of $82,507 per year on this International Harvester gear.

Over 4¢ saved on every part, 600 parts per hour when Lima-Hamilton TOCCO-hardens these shifting levers.

Hardening costs cut 80% by TOCCO-hardening wearing area of Link Belt Company conveyor trolley wheels.

Brazing



Kennametal, Inc. brazes carbide tips on these mining machine bits and hardens shanks at the same time. Output—one every 20 seconds.

Nash Motors cuts cost 60%, triples hourly output by TOCCO-brazing drain flanges to automotive oil pans.

A 6¢ TOCCO-brazing job saves $17.00 tools—saves $2,000 a month at a midwest automotive parts plant.

Forging



H. M. Harper boosts production up to 265% and die life up to 400% by TOCCO-heating non-ferrous bolt blanks for forging.

Scale was reduced from 2.79% to .79% by applying TOCCO to heating bar stock for forging rock drill bits at Timken Roller Bearing Company.

Forging die life tripled and scale reduced over 99% when Willy's Overland Commercial Forge Plant installed TOCCO Induction Heating for forging.

All These Jobs, And Probably Some of Yours, Can Be Done Faster, Better and at Lower Cost with TOCCO* Induction Heating

THE OHIO CRANKSHAFT COMPANY



TOCCO

Trade Mark Reg. U. S. Pat. Off.

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NEW **FREE** BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. A-1, Cleveland 1, Ohio

Please send copy of "TOCCO Induction Heating".

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

Vancouver, Wash., has been able to maintain near capacity production this winter and expects to begin operation of its rod and wire mill there within a month or two. As on other Northwest projects, bad weather has seriously delayed construction. Redraw rod has been received from the Alcoa Massena, N. Y., plant and will continue to be shipped in for drawing into wire until the rod rolling mill is completed.

Contracts have been awarded by Alcoa for construction of two new buildings and the extension of the present machine shop building at Vancouver.

Jobber Receives Large Order

Los Angeles—A steel jobber, Trojan Steel Co., recently received a 1400-ton order for reinforcing bars to be used in the construction of a $3 million geology and chemistry building on the campus of the University of California at Los Angeles.

The unusually large order for a jobber was placed by Russell Roemisch, subcontractor on the job for the general engineers, Haddock Engineers Ltd., of Oceanside.

The contractor placed his order for the bars through the jobber rather than the mill so as to have the jobber fabricate the material for him.

Operations at the plants of Bethlehem Pacific Coast Steel Corp. and Columbia Steel Co. probably will not be affected by the coal shortage for some time. Steel production at these plants depends principally on scrap supplies which now are adequate. However, Columbia's sheet and tin mills at Pittsburg, Calif., may have to cut production if curtailments at Geneva result in lowered production of the hot rolled coils.

No interference in production of pipe at Consolidated Western Steel, U. S. Steel subsidiary, is expected at least for several months.

Nonferrous Wage Pattern Raised

Salt Lake City—A wage pattern of five cents per hour increase and some fringe benefits have been firmly established in the nonferrous industry in this area. Affiliates of all the major unions representing mine and smelter workers, except the railroad brotherhoods, have signed contracts on that basis.

The most recent agreement was between the American Smelting and Refining Co. and the local representing employees at its Garfield plant. This union was a question mark because it disaffiliated from the International Union of Mine Mill & Smelter Workers to join the Progressive Metalworkers Council (which, in turn, was affiliated with the CIO Marine & Ship Builders Union). But when most of the PMC locals affiliated with the United Steel Workers of America, the Garfield local voted in the negative and retained its tie with the shipbuilders.

The new contract provides for the five cents increase, liberalized vacations and social insurance benefits on a contributory basis.

Study Results of Work Stoppage

Los Angeles—Possible results of a prolonged work stoppage in the coal mines were being studied by steel producers and users in this area with the consensus being that there will be no serious effects unless the walkout continues for 90 days.

First effect in this area was the banking of one of Kaiser Steel Corp.'s two 1200-ton blast furnaces "to safeguard coal and coke inventories."

Shipments of finished steel products will not be affected as the company has large inventories of pig, ingot, scrap and semi-finished steel on hand believed sufficient to carry it for 90 days.

In Utah, Geneva Steel Co. last week cut back one-third in its coke making, blast furnace and openhearth operations because of the coal situation. Blast furnaces at both Geneva and Ironton are affected. No curtailment in rolling schedules is anticipated in the immediate future.

COULEE DAM, WASH.: Discharge pipes near the Grand Coulee Dam pumping plant. Each pair of pipes could supply the domestic water needs of the combined populations of New York and Chicago.



Company Ordered to Curb Smog

Los Angeles—Columbia Steel Co. has been granted ten months to install equipment to control the emissions from all four of the openhearth furnaces at its Torrance, Calif., plant.

The control equipment is said to be the first attempt to completely catch the emissions from openhearth furnaces.

The order to install the equipment came after negotiations between the company and the Los Angeles County Air Pollution Board, and experiments during the past several years.



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For further details we suggest that you contact our sales and metallurgical staffs, whose one purpose is service to you—our customers.

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WISCONSIN STEEL

THE FEDERAL VIEW

THIS WEEK IN WASHINGTON



Office of Rubber Reserve has unique price-absorption system . . . FTC says it's illegal for private industry . . . New steel once-over in Congress

by Eugene J. Hardy

Washington—The small, fuzzy-thinking clique in the Federal Trade Commission which maintains that freight absorption, collusive or non-collusive, is illegal price discrimination might stop and take a look at an instance where the Government, in selling a commodity in which it has an exclusive monopoly, has always absorbed freight and finds it quite satisfactory.

The Office of Rubber Reserve of the Reconstruction Finance Corporation sells all of the general purpose synthetic and butyl rubber manufactured in the U. S. Since it made its first shipment in 1942, it has sold this synthetic rubber under a plan which it calls a "uniform freight rate method."

Transportation Costs

Under this method the purchaser is charged 18½¢ a lb f.o.b. the plant or warehouse, and in addition is charged ¾¢ a lb freight for carload lots and 1.2¢ for less than carload lots, regardless of destination. The Government takes the gain or loss, as the case may be.

Actually, there has been no profit on freight largely because of the ever pyramiding freight rate structure. In fact, the Government generally takes a little loss on freight which is absorbed in the price of rubber.

No Cause for Complaint

There has been no criticism of this method of selling on the part of RFC. For that matter, the reasons for its inception are very logical. There is no free market for synthetic rubber and the buyer cannot seek his suppliers. In fact, he takes the rubber from whatever source is decreed by the Government. Therefore it was decided that the only fair method would be to set up a price structure which would bring about uniform prices throughout the country.

In this somewhat peculiar monopoly position, absorption of freight was the only logical answer. RFC says that the system of pricing was looked into rather thoroughly by congressional committees which drafted the legislation now before the Congress and designed to end the FTC-caused muddle over the legality of individual freight absorption. Admitting that the Government's position in the synthetic rubber industry is unique, it would appear nonetheless that it is only fair to permit industry to do what the Government has been and is doing.

Rep. Celler Seeks to Prove Steel Companies Are "Too Big"

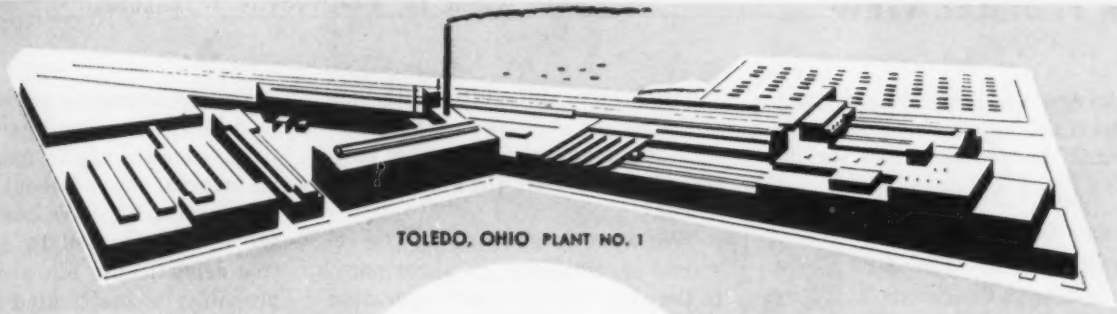
Several congressmen are polishing their knuckle-dusters this week in anticipation of giving the steel industry another "roughing up" soon.

The congressional beef isn't price rises this time. Maybe that's because the steel companies did such a good job of presenting the facts last month.

This time it's size.

They're too big, according to Representative Emmanuel Celler, D., N. Y., who currently is the number one rougher-upper on a House Judiciary investigating subcommittee.

Mr. Celler has set Mar. 15 as the opening date for public hearings on the new "crisis." And David Cushman Coyle, part-time economist who serves as manager and bucket



TOLEDO, OHIO PLANT NO. 1

7

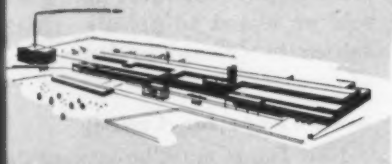
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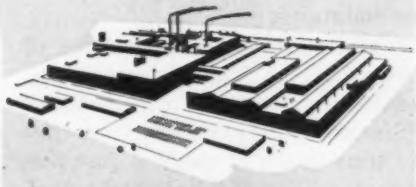
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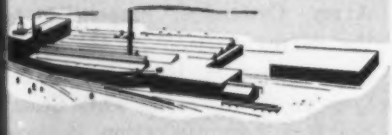
OUR RESEARCH DEPARTMENT offers its assistance for development work.



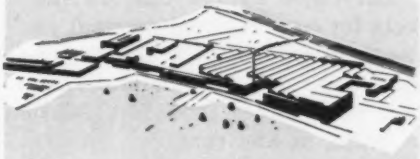
TOLEDO, OHIO PLANT NO. 2



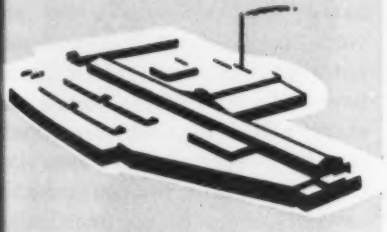
GRAND RAPIDS, MICH. PLANT NO. 3



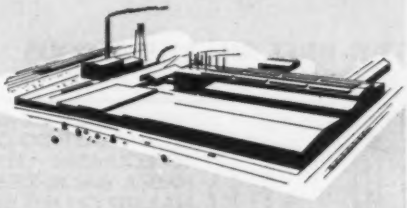
POTTSTOWN, PA. PLANT NO. 4



BATAVIA, N. Y. PLANT NO. 5



BATAVIA, N. Y. PLANT NO. 6



CHICAGO, ILL. PLANT NO. 7

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boy to the Brooklyn congressman, is currently refurbishing some old economic debates as fodder for the coming investigation.

Too Big for Comfort

For instance, says Mr. Coyle, "size is always dangerous." It's up to the Federal Government, acting through Congress, to keep a constant watch on "big business" and to trim it down if it gets too big, he maintains.

"We want to limit the size of everything to what is needed by technology," Mr. Coyle believes. "Size should be examined from time to time to see if there is justification for it, particularly technological justification," he adds.

Antitrust Laws Considered

Mr. Coyle figures that as subjects for congressional hearings go, the "size argument" is ripe for exploitation. It's been several years since the subject was last talked to death, at any rate.

The train-of-thought around Mr. Celler's office these days runs something like this:

"Does size interfere with the antitrust laws? We want to find out. Shall we write some new antitrust laws to limit the size of companies?

"We want to know about the rewards of efficiency to a company. Is the steel industry now operating efficiently, or could it operate more efficiently if the companies were broken up? What is a good size for a steel company, anyway?"

These and other thoughts are being built up to provide ammunition for Mr. Celler. Come to think of it, the steel industry hasn't been on the hot seat at the Capitol for nearly a month now.

Emergency Facilities Ready

Uncle Sam has at his call more than $7 billion worth of industrial facilities which could be put into war production on short notice should the occasion arise. Cost to the government approximates about $70 million annually, mostly for protection and maintenance of about 150 plants in inactive or standby status.

THE BULL OF THE WOODS — By J. R. Williams



The departmental reserve, wherein military departments hold plants titles, consists of 270 plants having an original cost of about $5 billion. At present, 173 have been leased or are being operated by the respective departments but about 20 will probably be inactivated next year.

Some 200 plants, with an original cost of $2 billion, make up the national reserve. Only about 50 are inactive, the remainder having been sold or leased to private industry subject to a recapture clause in case of an emergency.

Seek Funds for Upkeep

New funds must be appropriated for maintenance each year, although about 20 pct of the cost is later returned to the Treasury general fund through rental payments. Army Ordnance, responsible for the major portion of the departmental reserve, is asking $45 million for maintenance, while General Services Administration, in charge of inactive national reserve plants, seeks about $10 million.

Other defense departments such as the Signal Corps or Navy Ordnance responsible for a few individual plants, need varying smaller amounts to increase the total to between $60-$70 million. Actual monetary needs of such departments for this purpose are not clear since they are usually lumped under the category of industrial mobilization planning.

Machine Tools Put in Reserve

Under another phase of the defense program, an estimated 143,000 items of machine tools and other production equipment has been placed in reserve, most of it consisting of surplus from war plants.

Most of the items available from surplus property has been acquired and little money will be used for this purpose in the coming year. Expenditures will be largely in the field of maintenance and rehabilitation of items now in storage but more than a year will be required to see that all such equipment is in working condition, ready to be placed in operation.



IRON AGE
Special Report

Selling Welfare Enterprise



Is the only way to halt the trend toward the welfare state.

By **BILL PACKARD**
News-Markets Editor
THE IRON AGE

If someone had said to you last year that the A-bomb would become obsolete in 1950 you would have told him he was crazy. At least you would have thought so—even if you managed to think of some polite answer. But if someone were to make such a statement today you would be inclined to agree with him—at least you would recognize the possibility of truth in his prediction.

The past 20 years have seen a major depression, a world war and a host of changes affecting almost every part of our lives from cradle to grave. "This changing world" is changing at such a dizzy pace that we are hard-pressed to keep up with our time—let alone trying to peek into the future.

Yes, we have the A-bomb, the H-bomb and all sorts of instruments, indicators, gages, dials, controls and gadgets. And television has bred a generation of living room squatters. All activity has been speeded up. All avenues of knowledge have been broadened. The busy man has become busier. The demands on his time are terrific! So he wants everything in capsule form.

This special report tells how welfare enterprise—or personal initiative—is being explained to workers and the public. It shows why education is the vital key, why the annual economic battle must be avoided, and why communications channels must be kept open. But it is going to be short, so that you can tune in Uncle Milty at eight o'clock.

Why Welfare Enterprise Must Be Sold

THE art of selling welfare enterprise—or personal initiative vs. the welfare state is relatively new, an outgrowth of enlightened management. It is practiced today by a growing group of industrial leaders who recognize that welfare *enterprise* is the only thing that can halt the growth of the welfare *state*. These leaders know that good industrial relations are plain good business for the company that practices them. That's why they are spending more time and money on them than ever before.

It is called an art rather than a science because it is not exact. It varies from industry to industry and from company to company. But wherever it is found it embodies certain fundamental concepts. These concepts are rapidly forming a new pattern of corporate behavior toward employees and the public. They hold forth today the brightest hope in a field that is so fast-changing that 20 years ago seems like the dark ages.

But such an art could not have flourished 20 years ago. Enlightened management first had to understand the vital importance of relations with its workers and with the public. Industrial relations and public relations jobs had to be filled with top-notch personnel. These had to be made important executives with authority to do the job. Then they had to be given time to prove that dividends can be derived from these jobs as surely as they can from selling the company's product.

Also during the past 20 years two things have drastically altered the outlook in this field. They are: (1) The growth of unions; and (2) the establishment of collective bargaining as the law of the land.

In 1900 unions in the United States had less than 1 million members. In 1933 when section 7-a of the National Recovery Act became law there were only 2½ million union members. Soon after the Wagner Act was passed in 1935 union membership had grown to 6 million. After that membership expanded rapidly, reaching 9 million in 1939, 11 million in 1941, and 15 million in 1946. Today it is about 16 million.

In retrospect modern labor legislation seems to have been a process of groping for legal balance in labor-management relations. But through it all collective bargaining has emerged as the law of the land. If our Federal government has any long-term policy in the field, this is it.

Collective bargaining became law in 1935 with the passage of the Wagner Act. The cries of industry upon the passage of the act were not unlike the cries of labor upon the passage of the Taft-Hartley Act in 1947.

Both acts were designed to remedy the abuses of their time. The Wagner Act provided the worker with recourse for his grievances. It protected him from being discharged as a result of seeking higher wages or better working conditions. And it gave a legal blessing to his long efforts to bargain collectively.

Abuses such as the sitdown strike, mass picketing and coercive tactics were employed by labor opportunists under the protective cover of the Wagner Act and under the guise of labor advancement. The individuals and unions who fostered these abuses were few. Yet the abuses occurred with sufficient frequency to build up a slowly rising tide of public indignation against the unions. This set the stage for the passage of the Taft-Hartley Act which gives labor and management equal liability as well as equal rights. Collective bargaining remained law.

But strange things have been happening to collective bargaining. It is now Collective with a capital C. At first it was conducted on a plant-by-plant basis. Then it moved up to a company-by-company basis. Now it is industry-wide. In any selected industry the union throws its entire weight into the bargaining with a selected company until it reaches an agreement. Then it crams the "pattern" down the rest of the industry's throats. The company's competitors have to sign or lose out.



GRASS ROOTS ECONOMICS

A big steel company will soon open a school to train foremen and supervisors in basic economics. It will be staffed by a college-type faculty that will stress fundamentals.

Schools for management's representatives are not new. What is new about this program is that it will be basic. The thinking of the executives of this company is that if these men are trained in elementary principles they will be equipped to cope with any reasonable question they may be asked.

So instead of loading the "students" with concepts of capitalism that may be a little difficult to understand they will be taught the basic principles behind these concepts. The theory is sound: If a man knows the things that make personal initiative and free enterprise work he can use them in any situation. He need not know the answer at once. He can figure it out. He can *sell* welfare enterprise.

Then why don't the companies join together and bargain with the union on an industry-wide basis? Mention it to one of them and they will probably crown you with a volume of corporate law—anti-trust variety.

As a matter of fact the ability to pay varies widely among companies in the same industry. Location is important, too. Wages are higher in New York City than they are in Horner's Corner, Mo. So is the cost-of-living. The fact that a vastly different set of circumstances surrounds each company was brought out very well at the hearings before the Steel Labor Board last summer.

The board recognized this and in its report said, "there should be a return to collective bargaining in order to provide an opportunity to each company to prove that the considerations, conclusions and recommendations herein discussed are in fact not applicable to it. "There should be bargaining between the union and each company to ascertain what deviations, if any, should be made from the general recommendations." All most people remember now is the recommendation for 6 and 4.

There is plenty of food for thought in what the board said. Undoubtedly it had in mind that industry-wide bargaining too often results in battles of economic power—never really settled, but renewed each year. The annual agreements are not necessarily equitable. They are just as often propitious. Worst of all they often require government intervention.

This situation is fraught with terrific implications—both political and economic. Combining a labor monopoly with government paternalism and political expediency is not conducive to industrial statemanship. Nor is it likely to result in an agreement more equitable than a politically expedient compromise.

Welfare Enterprise vs. the Welfare State

To those who believe the function of government is to serve the people, to preserve personal freedom, and to guarantee equality of opportunity, this is not the way. This path seeks the more abundant life through more taxes, more spending, more controls and less liberty. The government grows stronger and the people grow weaker. It is the way of the welfare state.

Opposed to this, enlightened management today is offering welfare enterprise. It is meeting the situation realistically. It is finding out what workers want most from a job and it is providing it. To do this job properly requires an effective educational program. It must start at the very top of the organization. And it must carry right on down to the individual job level in the plant.

Just making information available is not enough. The channels of information have got to be checked and rechecked to make sure that they are not clogging up. There should also be a cross-flow of information between departments. This can be done by holding regular meetings of all management levels with top management. These meetings can be followed up with plant newspapers, magazines, letters, etc.

A lot has been written and said about what workers want most from a job. Some of these ideas have come from the workers themselves. But in too many cases they are some one else's idea of what the worker wants. The only way to attack this problem is on the job-level, getting the information from the workers.

A company that is using this method effectively is Hotpoint, Inc., Chicago. According to James J. Nance, president, "our information and training program ranks in importance with our sales, engineering, and other major activity programs. That is also why our industrial relations department head has vice-presidential status. An important aspect of this type of educational program is providing the kind of job the American worker wants. We at Hotpoint found that our people want nine things in a job. Not one of those desires is unreasonable or is impossible for industry to satisfy. As a matter of fact, they are just about the same things management wants from its own jobs.

After all, many in management started out in the plant. [Here are the nine wants:]

(1) Good pay
(2) Good working conditions
(3) Good bosses
(4) Steady work
(5) A chance to get ahead
(6) Respectful treatment
(7) The facts about what is going on
(8) A feeling that the job is worth doing
(9) A liking for the job based on finding it interesting and satisfying."

The Annual Economic Battle

These wants are not unreasonable. Most of them can be provided without added cost. The rest can be resolved by collective bargaining. But collective bargaining, as it is practiced today, is not contributing to better relations. It is evident that some means must be found to avoid the annual economic battles which have become constantly recurring sources of bitterness on both sides.

With the present scope and power of unions, what will happen in future bargaining sessions if the business cycle should turn down? Will labor take its cut? Or will entrenched union leaders who owe their power to a series of "bargaining" successes refuse to accept sharp wage cuts? What will happen to business caught in such a squeeze?

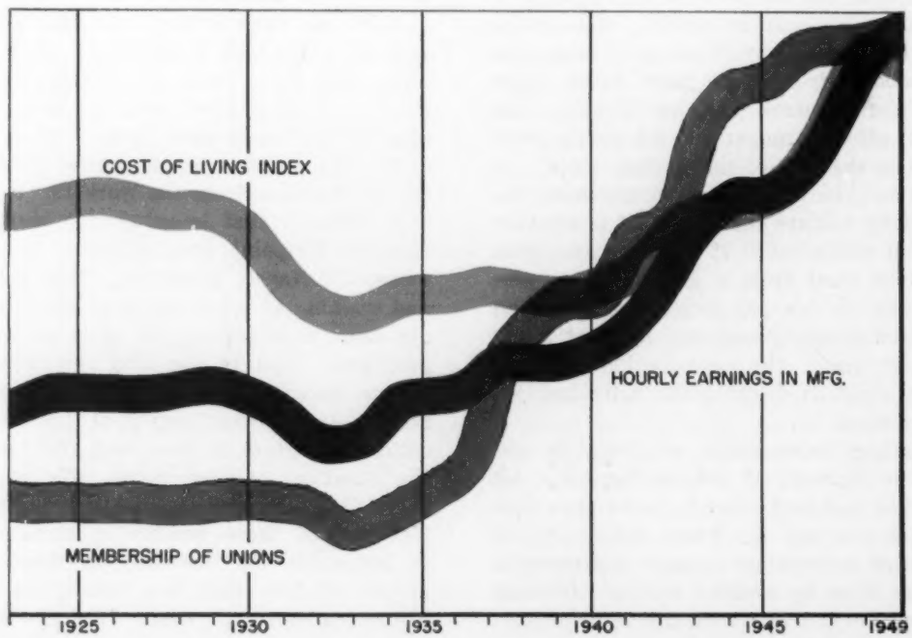
There are valid arguments—including lack of wild speculation, government spending, etc.—which indicate that any future recession will not be as deep or last as long as the one we experienced 20 years ago. But shutting one's eyes to such a possibility is a form of whistling in the dark that could end in disaster. It's like the soldier who went psycho . . . walked down the middle of the street while it was being bombarded . . . yelling, "They can't hit me!" . . . But they did.

Maybe there is no panacea that will completely solve the annual bargaining problem at one fell swoop. But several avenues of approach are available. They could hardly be accused of offering worse results than some companies are obtaining under the present set-up.

Apparently the most desirable aim would be to solve the problem once and for all—by ending the annual economic battle between management and union. The GM contract, with wages tied to the Bureau of Labor's cost-of-living index, is a bold attempt in this direction. Signing this new type of contract required real statesmanship from both management and union.

This contract has not been without criticism. The ink from its signing was hardly dry on the paper when militant, rival labor leaders blasted away at it. They accused the union of "selling out" and a lot of other things. Some segments of management criticized it, too. But it is significant that they offered no solution to the annual tug-of-war in its stead.

Rival labor leaders' most commonly voiced objection was that tying wages to the cost-of-living index was an admission of satisfaction with the status-quo. Then they would continue with one of their favorite discussions of how they were not satisfied with the status quo, how they expected to get more for their workers, how they expected to improve their lot.



EDUCATION—WHERE DOES YOUR COMPANY STAND?

- ☐ 1. Newspaper.
- ☐ 2. Magazine.
- ☐ 3. Movies.
- ☐ 4. Clear, easily understood explanations of the company's financial reports.
- ☐ 5. A constant flow of information in all directions—top to bottom, bottom to top, and between departments.
- ☐ 6. Constant readiness by competent personnel to answer all questions regarding your company to your employees as well as the public.
- ☐ 7. When grievances are dealt with is an explanation given?
- ☐ 8. Do you have an information rack?
- ☐ 9. Does it include helpful information other than that about your company?
- ☐ 10. Do you have regular meetings to further this program?

Here is the payoff question. Are you CONSTANTLY checking all phases of your program to find out what your employees honestly think of you?

Under analysis, this argument doesn't hold water. There is an improvement clause in this contract. It is included as an annual factor and is underwritten by the company in the amount of 3¢ per hr. The workers under this contract do share in the prosperity of America. It will be interesting to note what takes place when contract negotiations are reopened this spring. That pensions will play an important role in the bargaining is a foregone conclusion.

Here is an interesting comment by C. E. Wilson, president of GM almost 2 years after the controversial contract was signed. "A proper basic wage rate is a matter of first importance in any employment relation. While wages are usually thought of as so many cents per hour, the purchasing power of an hour's wage is also a fundamental factor and perhaps it has not always been given sufficient weight. . . . It is impossible to persuade workmen to take a reduction in their standard of living as a result of inflation, and ordinarily there is no good reason for them to do so. On the other hand, frozen wage rates in the face of decreasing living costs may result in relatively high prices for the products being produced which ultimately result in reduced sales and unemployment. These principles were recognized in the General Motors-Union Agreements in the spring of 1948."

Time will place this agreement in its proper perspective. It might show plenty of bugs in it. Maybe BLS's cost-of-living index is not the right index to use. Maybe the annual improvement factor should not be 3¢ an hr. Maybe it should be 4¢ or 2¢. But the idea of tying wages to some type of index seems sound.

It should put an end to "shotgun" bargaining. It should eliminate the costly, sometimes bitter, economic battle. It should forestall the government from paternalistic intervention in labor disputes. And it should decrease the feeling of rank and file union members that they need a strong leader, with dictatorial powers, to lead them in their annual economic warfare. Maybe that is what some union leaders are afraid of.

WHAT DO YOUR WORKERS WANT MOST?

- ☐ 1. Good pay?
- ☐ 2. Good working conditions?
- ☐ 3. Good bosses?
- ☐ 4. Steady work?
- ☐ 5. A chance to get ahead?
- ☐ 6. Respectful treatment?
- ☐ 7. The facts about what is going on?
- ☐ 8. A feeling that the job is worth doing?
- ☐ 9. A liking for the job based on finding it interesting and satisfying?
- ☐ 10. Security?
- ☐ 11. Other?

Don't rank these yourself. Take the question to the only people who can answer it—Your Workers.

Effective Education—Vital to Incentive

Profit sharing and incentives have contributed substantially to good human relations in some companies. But on the whole unions regard them with the blackest kind of suspicion. These methods appear to have been successful only where good relations existed before they were installed. These methods would appear to have been a result of good human relations rather than the cause of them.

Recently, I had a long conversation with an employee of Oneida, Ltd., Oneida, N. Y. This company has a profit sharing system which he referred to as a bonus. This man is really sold on his company. He will do more to sell it to his fellow employees and to outsiders than any amount of literature the company could churn out—no matter how much they spent.

This man knows a lot about his company, too. He knows when it was founded, by whom and how. He knows its history, good and bad, up to the present day. He also knows a tremendous number of his fellow employees. Of course, this can be partly explained by the fact that Oneida is a small community and he grew up there. But there is a lot more to it than that. This man is full of real, keen interest and pride in his company, as well as his own personal job.

I was not surprised to learn that this company has a definite training program. That it has amazingly effective channels of communications, both vertical and horizontal. This company would

probably have excellent relations with its employees even if it didn't have the bonus plan. But that, too, is paying off now because good-faith was established first.

What does the working man want? He wants a lot of things. But most of his wants fall under three main headings: (1) Better living conditions, (2) better working conditions, and (3) security.

The worker has never been sold on the advantage of higher productivity. He never will be sold on it until he becomes convinced that it is a matter of great personal concern to him. He knows that he buys the things he needs with his paycheck. And he feels that the more articles he makes the more money his employer will have to put in the bank. Meanwhile, he keeps pressing for more money in the pay envelope.

Such are a few of the working man's thoughts on better living conditions. That some of them are not correct is as much the fault of management as of himself. It is only in recent years that management has bothered to try to explain a few of these things to him. Many companies that have long followed the practice of making detailed reports to stockholders have never tried to explain company finances to the workers.

The worker resents this. He feels that the company is holding out on him. That it is making a great deal more money than it says. Moreover, he wants to feel that he has an interest in the company and he is frustrated by a lack of knowledge of its affairs. Some companies that have taken the trouble to explain what happens to their sales dollar have been well repaid for their trouble in improved relations with their employees.

Security Covers Wants and Fears

The story of better working conditions is a happier one—at least it is recently. In this field of vital importance, management and labor—with some exceptions—have been cooperating remarkably well. It was not always so. But management has learned that providing better working conditions makes for greater productivity. Improvement in working conditions has been rapid, and it is continuing.

Security, to the worker, covers a broad field. In that word are wrapped many of his wants—and fears. He may never have had a course on the business cycle, or economic theory. But he knows what a depression is, and he fears it. He also fears old age without an income. As a result of these fears he wants a guarantee of a specific annual wage and a pension when he is too old to work.

Many types of industrial insurance and pension plans have been in operation for a number of years. The security-complex is causing the pressure for them to increase. It seems reasonably safe to assume that they are now in the cards for big and little plants alike.

The cost of these plans will be terrific. The exact amount for any given company depends on several factors. Is any type of plan now in effect? How big is it? How long has it been running? Is it funded? Or is it pay-as-you-go? How big is the new plan going to be? How many workers are there? What is the breakdown on their ages?

No matter how these programs are financed they are a cost of doing business. They are liabilities which will have to be met through thick and thin—through good years and bad. They will undoubtedly bear most heavily on those firms which show the highest unit cost. Here is where human engineering can help. A good education program can increase productivity—by boosting worker morale and improving his attitude toward his boss, his company and his work.

Education Teaches Enterprise Partnership

Any education program is not worth the time it took to set it up if it doesn't help the worker understand that he is in partnership with his employer—for better or for worse. Here are four things that one company* is trying to get across to its employees:

First—That they are engaged in a worthwhile enterprise; that their jobs have dignity and meaning; and that they will be justly treated.

Second—That they are part of a team competing against other teams for a share of the consumer's dollar and that their pay and their jobs depend upon their company's success in that competition.

Third—That a business must serve its stockholders and customers as well as its employees—that the customer is the real boss of the enterprise.

Fourth—That no other system of production has yet been tried either experimentally or on a large scale which has been anywhere nearly as productive as ours or which has afforded as large a degree of human freedom.

To sum this up in 50 words: Welfare enterprise can halt the walfare state. This requires good human engineering. Effective education which molds employee attitudes is the vital key, but other points help. Avoiding the annual economic battle will improve relations. Keep communications channels open. Find out what your employees want. Give it to them if you can.

* *James DeCamp Wise, president, Bigelow-Sanford Carpet Co., Inc., New York.*



Speaker's table at the welcome luncheon of the AIME. Left to right: Fred B. Seibert, president, Canadian Institute of Mining & Metallurgical Engineers; Cornelius F. Kelly, chairman, Anaconda Copper & Mining Co.; Dwight D. Eisenhower; and L. E. Young, retiring president, AIME.

AIME ANNUAL MEETING

THE American Institute of Mining & Metallurgical Engineers held one of the largest meetings in their history this week in New York City. Technical papers were presented on almost every conceivable subject in the mining and metallurgical fields. Research programs were reported on metals which a few years ago were practically rare and of little use commercially. Symposiums on titanium and powder metallurgy were extensive.

The week-long meeting was given an international flavor when General Eisenhower spoke at the welcome luncheon on Monday. Some observers thought that this speech might prove to be of great political importance. If so, General Eisenhower's choice of delivering such an address to the engineers is even more significant and symbolic because of the part they play in our domestic and international security.

Foley Talks on High Temperatures

One of the highlights of the week was the Howe Memorial Lecture delivered by Francis B. Foley of International Nickel Co. His talk, "Factors Affecting Deformation and Rupture of Metals at Elevated Temperatures," was well attended and widely discussed later by the members in the hotel lobby and rooms. The presentation of, "Metallurgy Behind the Decimal Point," delivered by E. E. Schumacher of Bell Telephone Laboratories, generated interest in the Institute of Metals Div.

Thursday was bessemer day. The recent renovation of thinking and practice of this steelmaking method was exemplified in two separate symposiums. R. E. Edwards of Jones & Laughlin Steel and A. B. Wilder of National Tube brought the group up to date on the latest converter operating practice. Mr. Wilder also reported briefly on the experimental use of oxygen in the bessemer blast at National Tube's new bessemer shop at Lorain, Ohio.

In the afternoon side blowing and basic lined vessels were discussed. C. E. Sims of Battelle Memorial Institute and F. L. Toy of Carnegie-Illinois Steel presented results of pilot plan research in which these two organizations participated jointly. This process, sometimes called Turbo Hearth* is considered by some steelmakers as an eventual arrival of the openhearth process. Actually, the method is a combination of bessemer and openhearth practice which many engineers believe could be more aptly termed pneumatic openhearth.

Titanium had its day on Tuesday, although uranium alloys were included in a joint presentation of new alloys. The previous day E. J. Maddex and L. W. Eastwood of Battelle reported on a continuous method of producing ductile type titanium. This paper was followed by another important presentation, "Electrical Resistivity of Titanium Slags," by James L. Wyatt, Titanium Div., National Lead Co.

Several Papers on Powder Metallurgy

Technical papers in the nonferous field were also numerous. The powder metallurgy meeting dealt with, "Control of Atmospheric Beryllium," and the "Behavior of Pores During Sintering of Copper Compacts." The diffusion theory of sintering was covered in a number of qualitative conclusions to express true pore shapes were advanced.

Another paper in the powder metallurgy classification was, "The Extrusion of Powdered Magnesium Alloys," by Messrs. Busk and Leontis of Dow Chemical Co. The authors described four new alloys directly extruded from magnesium alloy powder. Controlled solid-state diffusion methods were covered. Methods of interference hardening, control of stress-corrosion by cathodic protection, extrudability and use of steep alloy gradients for grain size control were presented.

*THE IRON AGE, April 21, 1949, p. 63.

MAKING JET ENGINE

Compressor

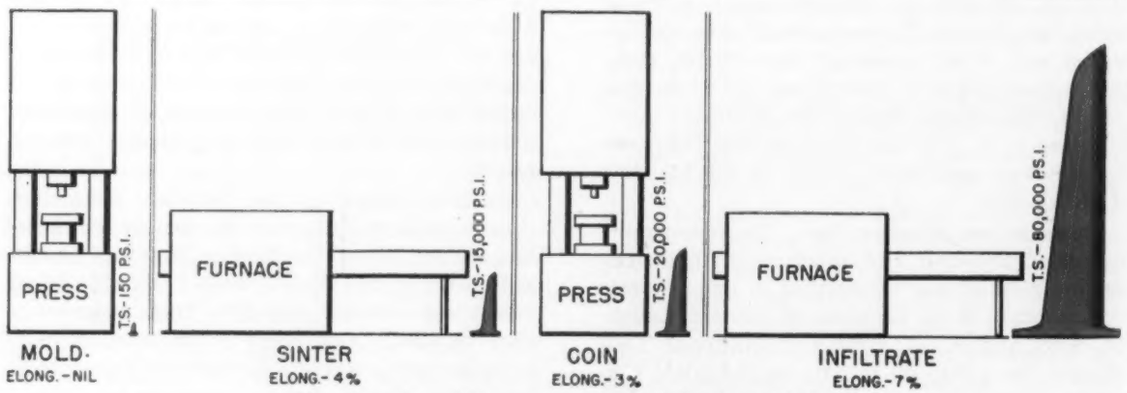
Powder metallurgy invades the field of higher strength metals. Infiltration of copper into an iron skeleton, plus sintering, coining and heat treating produce a high strength blade cheaper than the conventional forgings.

FOR a long time powder metallurgists have had the opportunity to consider manufacturing airfoil shapes, but invariably they have had to turn down these attractive high production applications of their technique because: (a) The shape could not be molded; (b) the required physical properties could not be attained. Both of these obstacles have recently been overcome resulting in the mass production by powder metallurgy of jet engine compressor blades. The blades operate at a temperature of 700°F.

Powder metallurgy has been an ideal method for manufacturing low strength parts economically and to reasonably close tolerances. It has also served where special properties, obtainable only through controlled porosity or special nonalloyable combinations of metals, or metals with nonmetals, were required. Consideration was also given to high strength parts duplicating the physical properties of low carbon steel or low alloy steels. The work done on parts made from these alloys was formerly confined to laboratory investigations involving long time high temperature sintering or several pressing operations with intermediate sinterings, or to the technique of hot pressing. This was essential to reduce remaining porosity to a minimum so that the best physical properties could be obtained.

Usually long time high temperature sintering is expensive and cannot be given consideration where accuracy in final dimensions is desired. High cost is the main limitation in achieving high strength in powder metallurgy parts by repeated pressing and sintering. It involves much handling and low die and punch life, since repressing pressures required to eliminate the last 10 pct of porosity are relatively excessive. As far as hot pressing is concerned, production rates are low, the equipment required rather elaborate and expensive. Also truly satisfactory, long-life die materials are difficult to obtain.

It would appear that high strength parts are outside the realm of powder metallurgy from a mass production point of view, were it not for another approach to the basic problem of eliminating residual pores in parts made from metal powder. Because the pores are difficult to re-



The steps in making compressor blades by infiltration techniques, showing tensile strength of blade after each operation.

Blades

By POWDER METALLURGY



By GEORGE STERN,
Director of Research



and
JOHN A. GERZINA
Chief Mechanical Engineer,
American Electro Metal Corp.
Yonkers, N. Y.

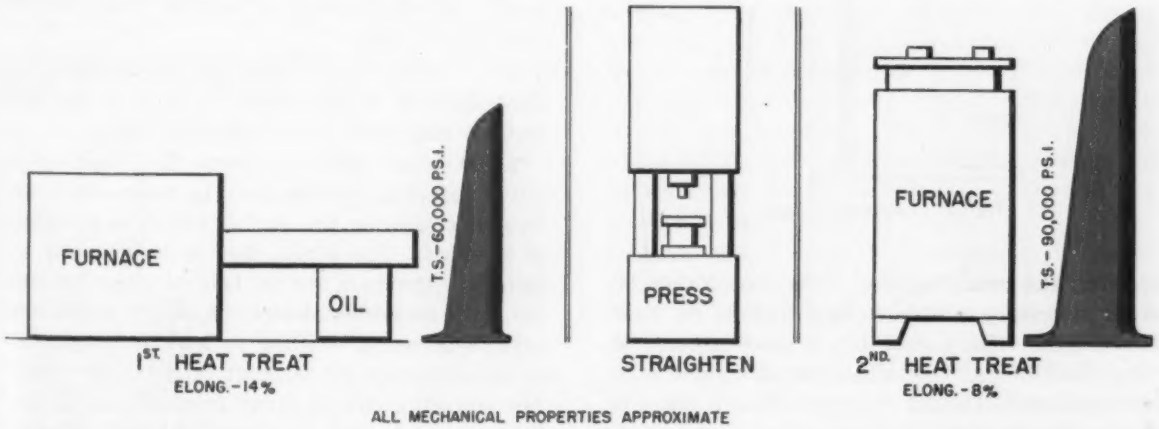
move by room temperature and high temperature pressing as well as by prolonged sintering, it was decided to fill them with another high strength alloy. This approach has been the basis for the work done on the infiltration technique by the American Electro Metal Corp. A typical photomicrograph of copper infiltrated iron is shown in Fig. 1.

Practicability of the infiltration technique had been demonstrated in the laboratory. A basic study of the variables proved the following were important: (1) Suitable alloys to use for both skeleton and infiltrant; (2) properties obtainable with various heat treatments, and (3) dimensional changes attendant with infiltration.

Upon completing this program the production of high strength parts using the infiltration method was undertaken by the American Electro Metal Corp. and Thompson Products Corp., a manufacturer of jet engine subassemblies. A glance at a typical stator compressor blade shows that this part represented as challenging a problem as can be conceived for powder metallurgy. The mere successful pressing of such a complicated shape would represent quite an accomplishment in itself, even if dimensional control and required physical properties were to be entirely overlooked. In addition, the tolerances were very close and the mechanical properties required were of the order of 85,000 psi ultimate strength and 6 pct elongation.

Prior to this practically all jet engine compressor blades made in this country were made by forging Type 403 stainless steel. Pressed powder blades could be made cheaper by substituting nonskilled personnel for the skilled operators required in the forging plants. The factor of die life weighed strongly in favor of the powder metallurgy process, where die life in the order of 500,000 pieces per alloy steel die is not at all uncommon. Furthermore, the infiltration process contemplated was one that would use an essentially iron skeleton infiltrated with an alloy consisting primarily of copper. Here again powder metallurgy had much to offer.

Little chromium is produced domestically. The drain on supplies of this strategic metal, in times

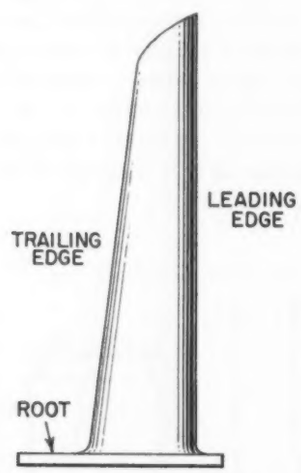


of national emergency, would be staggering, if all compressor blades were to be made of 12 pct chromium steel. The strategic advantage of using the relatively abundant raw materials iron and copper was another "plus" for powder metallurgy.

Compressor blades made by infiltration can be made to final shape and dimensions with only slight machining required on the root, and hence represent a process with no material waste as compared to the trimming and machining required on a forged blade.

Early experimentation and engineering study led to the conclusion that an unorthodox die would have to be designed to make up for the shortcomings of available powder metal presses. It was obvious that multiple coordinated motions above and below would be required to obtain the proper preform for the compressor blade. This led to the consideration of a sectionalized lower airfoil punch to achieve uniform fill for this portion of the blade. It was further realized that since the root was so much heavier than the rest of the blade, it, too, would require a separate punch to accommodate the larger fill.

A die was therefore designed having four lower punches, three for the airfoil, split longitudinally, and one for the root section. The press intended for the die had only one upper ram for one upper punch action, and a lower ram good only for



Typical compressor blade.

ejecting the molded piece. This meant that all other necessary punch actions had to be built into the die. The initial die, in consideration of time limitations, was therefore designed with springs inserted under the punch holder plates to supply the required floating actions.

Considerable experimentation was required to find the proper strength springs to return the lower punches to their correct position for subsequent fill without breaking the airfoil section during molding or ejection. When airfoil breakage was eliminated, a new difficulty arose in that the airfoil began to break off at the root. This was corrected by eliminating the springs and controlling the lower punches by friction. The three airfoil punches were fit snugly to the die. In ejection, the root punch carried the three airfoil punches up to a positive stop, for the fill position. The punches were then held in this position by their friction with the die.

The first coining die was made similar to a forging die. The concave side of the airfoil of the stator blade was raised on a solid piece of tool steel and the convex side was sunk into a second piece of tool steel. In each of these pieces was broached a rectangular hole through which came a root punch for the purpose of coining the root of the blade. During the early stages of development this coining die shown in Fig. 2 was used for all press straightening operations.

It was realized immediately that it would be impossible to mold the thin, knife-like trailing edge from iron powder. The thickness required on this edge was approximately 0.004 in. The problem was approached from the point of view of making a preform with the proper distribution of powder in its various portions, which could first be sintered and then coined to exact and final blade shape. It was hoped that during this coining operation sufficient material flow would occur to form the thin trailing edge as well as the somewhat thicker leading edge. Although the required physical properties could more readily be achieved if graphite was added to the iron powder for diffusion during sintering and strengthening of the final infiltrated shape, this possibility was ruled out in order to fulfill the need for a soft plastic preform that could be coined to form the thin edge.

The first three steps of the process are:

(1) Molding of iron powder with a suitable lubricant incorporated to a preform shape.

(2) Sintering the preform in a suitable jig to form a plastic, readily deformable body for the coining operation.

(3) Coining the sintered preform to the exact dimensions of a compressor blade with the thin trailing edge and thicker leading edge.

There were many problems that had to be solved before a preform could be made which was free of cracks on the airfoil and free of cracks in the root. The airfoil had to be properly attached to the root and be free of steps between the three longitudinal sections of the airfoil and capable of being handled sufficiently to place it in the sintering jig without introducing cracks. The sintering offered many problems, in jig and fixture design, and in obtaining good strength and ductility for subsequent coining.

Even when the molding and sintering problems

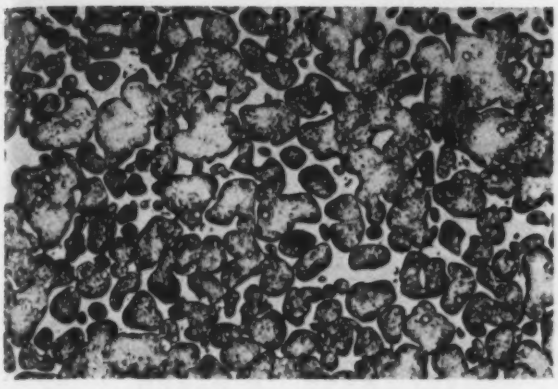


FIG. 1—Infiltration of iron alloy with copper. Picral etch; the white constituent is the copper. 100X.

appeared solved, the coining operation frequently revealed an improper distribution of powder in the preform. This introduced cracks, tearing apart of the airfoil from the root, or sometimes improper density in portions of the coined blade. Even when all these conditions were satisfactorily met, failures to meet width or thickness requirements in the airfoil or root of the blade were encountered.

These requirements as well as the needs of subsequent operations in the process meant that exact data had to be obtained on the shrinkage occurring during sintering and the conditions necessary during sintering to assure that the sintered preform would withstand the plastic deformation during coining. The proper molding punch designs and fill conditions required to obtain uniform density throughout the body during coining had to be developed. Also, the growth or shrinkage in infiltration and necessary allowance for same in order to keep the final blade to size was important. The hardness of the blade after infiltration and a method for properly softening it, so that a press-straightening operation could take place to bring the blade to final dimensions, had to be controlled.

Uniform density was an absolute must, for, if it were not met, infiltration of a copper alloy into portions of the blade with varying density would cause warpage. If infiltration did not take place in a uniform manner in each discrete region of the blade, a bimetal effect would be present with attendant warpage.

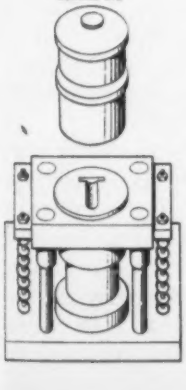


FIG. 2—Coining die used by American Electro Metal in making blades.

Properties of Final Blade

Dimensional Tolerances:	
Width	±0.008 in.
Thickness of airfoil	±0.003 in.
Contour of airfoil	±0.005 in.*
Straightness of airfoil	±0.005 in.
Twist	±½°
Mechanical:**	
Yield point	80,000 (65,000–90,000)
Tensile strength	90,000 (75,000–100,000)
Elong., pct	8 (15–5)
Rockwell B hardness	90 (82–98)
Bending angle	120° (180°–60°)

* If blade perfect on twist contour is 0.003 in.
** Physicals can be varied by varying heat treatment and raw materials when desired and figures in parenthesis indicate the range.

To accumulate these data, many detailed studies had to be made and, in many cases, new techniques devised to reach the required answers. In studying density of various portions of a coined blade, it was found necessary to devise a new, more sensitive technique for properly coating and weighing a small portion of the blade in air and a liquid. A Young gravitometer was used, but since the sensitivity was poor with water, s-tetrabromoethane was finally selected as a liquid to give a more sensitive reading.

A metallurgical study was made to develop special heat treatments that would render the blade suitably soft for the final press-straightening operation. With the blade straightened, it was also necessary to reharden it after straightening to assure the required physical strength.

The systematic solution of the problems enumerated led to a process shown in simplified form on pp. 74 and 75. In order to appreciate how far this process went beyond conventional powder metallurgy, the approximate physical properties at each step are indicated with the operation. Ordinary powder metallurgy would end with the coining operation, giving an ultimate tensile strength of approximately 20,000 psi, and an elongation of approximately 3 pct. This process, carried to completion, gives an ultimate tensile strength of 90,000 and an elongation of 8 pct. It must also be appreciated that by varying the heat treatment different final physicals can be obtained without sacrificing physical dimensional accuracy. This is shown in Table above where the obtainable range of yield points and ultimate tensile strengths as well as elongations and hardness is indicated.

As a result of this development it can be fairly stated that powder metallurgy has once more proven it has much to offer. Over a million jet engine compressor blades have been made within the required dimensional and physical properties. While exact cost figures cannot be made available, the cost of these powder metallurgy blades makes them highly competitive with forged blades.

MARFORM

A New Press Drawing Tool



By THOMAS E. LLOYD
Machinery Editor, The Iron Age

Using the best features of rubber press forming and steel die drawing, this new process permits deeper draws, lower tool costs and economical production on both large and small runs. It eliminates finish forming, handles various materials and thicknesses without tool changes. By forming pre-painted or finished stock it slashes finishing costs.

THE Marform process is a new forming process developed for producing higher quality stampings more economically. Since the aircraft industry requires a multitude of different parts and a relatively low quantity of each part, a process that yields high quality with a low tooling cost is vital.

This new process can best be understood by understanding the several processes that preceded it. The two processes that establish this background are the Guerin process, employing a punch and rubber pads, and deep drawing with a steel die.

The drawing process combines the forming ability of a steel die with the economical tooling of the Guerin rubber pad process. This objective has been attained to a high degree with certain minor compromises.

The Marform process utilizes the male punch similar to that employed in the Guerin process but it also requires rests. It is therefore unnecessary to make either a female die, pressure plate or draw ring. This means that it is unnecessary to make half of the tool formerly required for a drawn part, saving more than half the cost of the tool in many cases. The first reason is that

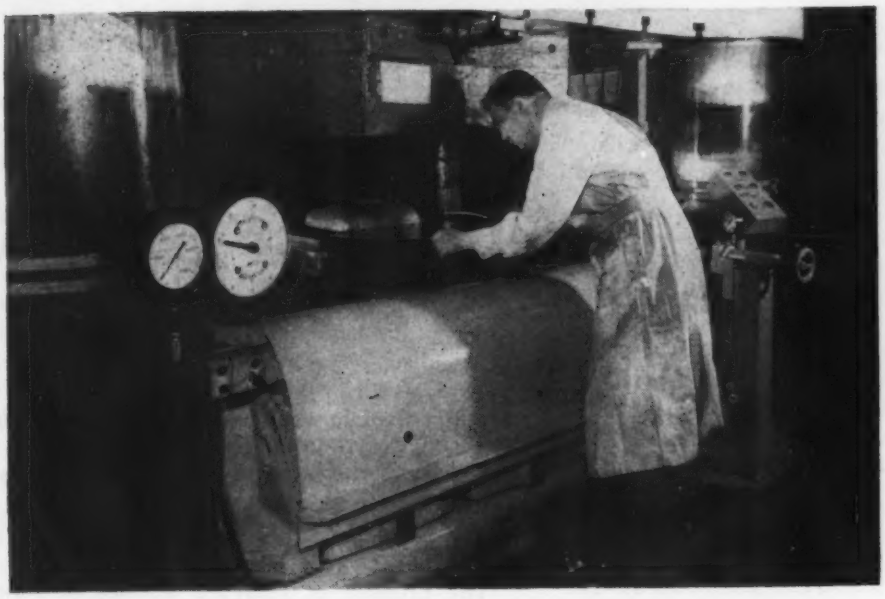


FIG. 2—Pressure and ram travel control are vital in Marforming. Pressure is cam controlled, the control being at the right of the operator. Depth of ram travel is shown on the large dial to the operator's left and pressure is indicated on the small dial.

the female portion of the tool is often the most difficult to make since it is more difficult to work down in a hole. The second and most important reason is that the matching problem between the two halves of the tool has been eliminated. This matching work or press setup is tedious and costly.

The forming punch can be made of Masonite for short runs on soft materials. Cast Kirksite can be employed for longer runs or harder materials. However, steel punches are generally employed for production runs, especially on harder materials. The flat plate on which the metal rests is steel. This plate must be flat and smooth but the fit between it and the punch is unimportant except when forming very thin metal such as 0.010 or 0.020 in. thick stock. However, a thin Masonite overlay can be employed on the steel plate on short runs to save the cost of surface grinding the steel plate. The inside periphery of the plate, where it surrounds the punch, and the outside periphery of the plate can be torch cut in most instances.

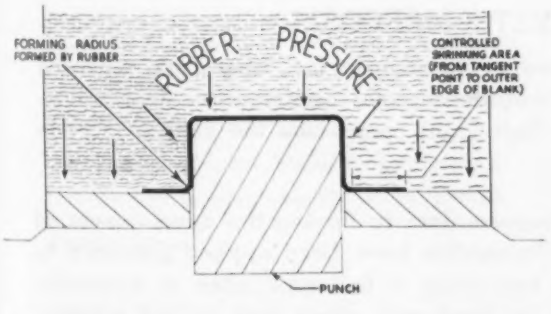


FIG. 1—The principles of the Marform process are illustrated here. As the punch, set into the bed, forces the blank into the rubber block, set in the ram, forming the part. Rubber pressure (actually resistance to the punch pressure) must be sufficient to alloy the material to shrink without wrinkling.

The press setup time on a tool is small since the male and female portions of the tool do not have to be matched and since more than one form block can be used in one pressure plate or in separate pressure plates on the same machine. The pressure requirements and depth of stroke must be equal, however, for all parts formed at the same time.

Although Marform does not give the embossing definition of a steel die, at least in its present state, it outperforms a steel die in many cases and in more important aspects. For example, the forming ability of a tool or material is generally judged on the basis of the depth of round cup it will draw on a given size of punch. This is stated another way by saying the basis of drawability is the percentage reduction in area which can be made on a blank in one forming operation.

A 40 pct reduction in area is generally expected on a steel die when forming aluminum alloys for example; and a reduction in area of 50 pct can be attained if extra diligence is exercised. However a reduction in area of 57 pct is considered normal in Marform work on the same material and as high as 70 pct has been attained in testing operations.

In like manner, a cup depth equal to the radius is normally expected from a steel die, while a depth equal to 1½ times the radius is normally expected in Marform on the same material and depths equal to 1.2 times the diameter, or 2.4 times the radius, have been attained in certain cases. All of this means that the Marform process can sometimes form a part in one operation that would otherwise require two operations.

There are several apparent reasons for this added formability, One of the most obvious reasons is the fact that the rubber has a certain

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cushioning effect and therefore prevents rapid application of strain at any point on the metal in contrast to the situation in a steel die where localized applications of strain may on occasion be quite severe.

The rubber also exerts a lateral pressure during forming, which is a direct result of the applied forming pressure. This lateral pressure has the effect of wrapping and locking the metal around the male portion of the tool. This prevents an accumulation of strain at the punch radius, and thereby distributes strain uniformly over the complete surface of the piece to be formed. The importance of this is demonstrated by the fact that when most steel die formed parts fail, failure is in the top popping out along the line of the punch radius.

The prevention of strain concentration at the punch radius not only enables the part to be formed deeper, but causes the part to be more satisfactory in certain applications where uniform thickness is important.

There is another related advantage in the fact that the rubber locks the material against the punch. This arises from the phemonena that local elongation in metal can be safely higher than elongations over a relatively longer gage length. The rubber automatically causes the metal to be strained over a much shorter gage length by locking it just above the instantaneous point of forming, therefore providing the elongation available from the shorter gage length.

The third factor that enables the Marform process to form a deeper part in one operation is the ability of the machine to provide an exact required pressure on the material at each desired depth of stroke. This pressure can be varied in either direction. In other words, it can start low, be increased, and then drop off; it generally can be increased from start to finish; or it can be started at a high value and then dropped gradually to a lower value. The pressure variation can be infinite within the minimum and maximum values, and therefore it is not a series of steps. This pressure is cam controlled as shown in Fig. 2.

There are several other advantages claimed from a forming standpoint in the Marform process, such as precision of shape. Sheet metal parts can be made to a tolerance of ± 0.002 in. A tolerance of ± 0.005 in. is commonly obtained on parts where the shape is sufficiently rigid to maintain such accuracy.

The Marform process also has an advantage on very thin materials. Material as thin as 0.010 in. has been successfully formed and a 0.012 in. thick cup was deep-drawn to the point where the depth of the cup was 0.9 of its diameter. Gages as thick as 0.675 in. in aluminum alloys and 0.102 in. in SAE 1010 steel have been formed. Parts made by the Marform process are shown in Fig. 3. This is not necessarily the maximum but represents the thickest gages formed to date.

The problem of applying finishes to formed shapes is sometimes critical from the economy standpoint. This is particularly true of polished surfaces. It is more economical to polish material in the flat state and then form the parts. This results in marred finishes when the normal processes are used. However, round cuts have been formed on the Marform machine successfully where the material had been previously coated with such finishes as Vinyl, aircraft paints, and crackle paints. This experiment was also performed with polished material.

Tapered shapes are a major forming problem. Any tapered shape tends to wrinkle, due to the distance between the punch and the pressure plates of the die at the start of the forming stroke. Such shapes are important to industry because they are attractive, they will stack better, and they save metal. It is difficult to quote a rule on what can be accomplished with the limited experience, but the following examples will serve as a guide as to the severity of taper that can be formed without wrinkles.

Consider a 4 in. diam on the top of the punch

HYDROPRESS MARKETS MARFORM

Glenn L. Martin Co. has accepted a proposal of Hydropress, Inc., New York, whereby Hydropress will manufacture and sell Martin's Marform metal forming units. In addition, Martin will continue to make available to individual companies the surplus service capacity of its Marform units.

A. B. Zeitlin, assistant to the president of Hydropress, Inc., in tracing the development of hydraulics in presswork, said that heretofore hydraulics have been applied primarily to the press itself. The Marform unit marks the beginning of the application of hydraulic principles to the fixtures in the press, and can be used with either new or old presses. Further, while never tried, it is believed no difficulty would be experienced in using the machine on mechanical as well as hydraulic presses.

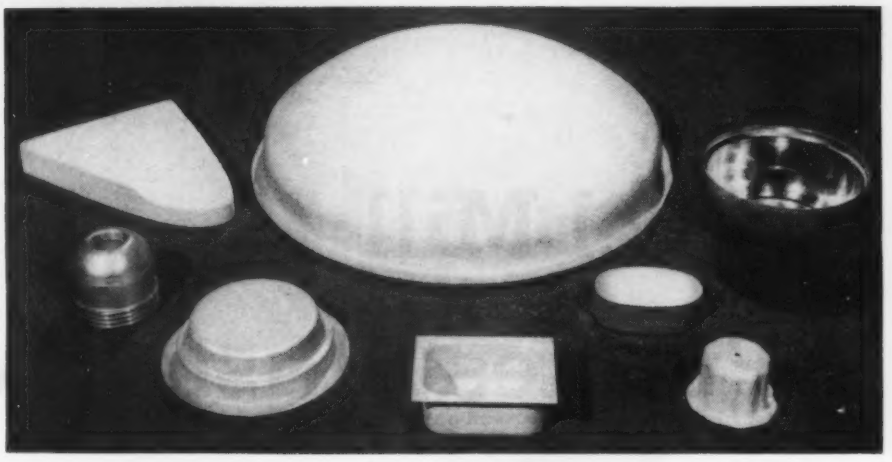


FIG. 3—These parts were formed by the Marform process. They range from 0.010 in. aluminum to 0.109 in. deep drawing steel and represent a variety of shapes.

and with a taper outward toward the bottom of the punch. On such a punch, the gap could be 0.5 in. between the punch and supporting pressure plate for 0.025 in. thick steel. This gap can be increased to ¾ in. with the gage of the steel increased to 0.050 in. The gap can be 3/16 in. with 0.025 in. aluminum and ⅜ in. with 0.050 in. aluminum. Developments are underway that may permit a radical improvement in the permissible taper in one operation.

ADVANTAGES CLAIMED FOR MARFORM

(1) Often permits deeper draws in one operation than possible with conventional methods.

(2) Makes possible such reductions in tooling costs in a low as well as high volume production.

(3) Offers considerable economies for those industries with frequent product design changes.

(4) Eliminates finish forming of parts by hand as now required on parts formed with rubber.

(5) Permits simultaneous forming of several different parts, of complicated contours, each having similar pressure curves.

(6) Permits forming parts of varied materials and thickness within a reasonable range with little or no change in tooling.

(7) Distributes strains in the formed parts more uniformly throughout the piece, resulting in formed parts relatively free of internal strain concentration.

(8) Maintains practically uniform wall thickness from blank to part in a deep drawn part.

(9) Permits drawing after surface finishing of the metal and coatings, such as some paints and plastics.

(10) Can be adapted readily for hot forming.

(11) Permits forming greater tapers without wrinkles than by other current processes except spinning.

The current Marform equipment varies as dictated by the development progression, and by the basic press equipment available. The presses employed currently at the Martin Co., are of 800 tons and 3500 tons capacity. The 800 ton press is used in conjunction with a Marform unit which has a 16x18 in. forming area, which provides a forming pressure of 5560 psi.

The 3500 ton press is used with a 28x31 in. forming area which offers a theoretical forming pressure of 8060 psi. However, utilization of this maximum pressure increases the maintenance cost on the equipment so that this press is not used to provide more than 7000 psi. These pressures noted can be translated directly into working pressure on the metal in the Marform unit itself.

The speed of operation of the smaller press enables us to obtain 120 cycles per hr, which may result in a multiple of that number in pieces per hour since more than one piece is often formed at one time. The large press operates at a speed of 60 cycles pr hr, and this rate can be multiplied by the addition of more parts in the same stroke. This speed of operation is based entirely upon the speed of the hydraulic press equipment on hand and can be increased to match the speed of any faster hydraulic press. No attempt has been made as yet to apply a Marform machine to a mechanical press but there is no reason to believe that such an application would be unsuccessful if the press had sufficient daylight opening and proper power.

There are many things planned for further investigation such as a wider application of the process; development of allied tooling for secondary operations, which has already shown considerable promise; further investigation of the fact that the Marform machine can automatically and simultaneously shear material at any direction to the forming stroke; simplification of the equipment; and more extensive use of conservation of energy principals.

Steel Mill Purifies Waste Water



By WILLIAM CZYGAN
Assistant Editor
THE IRON AGE

High concentrations of industries producing water-contaminating waste products creates a serious problem for heavily populated industrial sections. Extensive state programs of stream pollution abatement require industrial plants located on rivers to install purification equipment.

IN cooperation with Pennsylvania's extensive stream pollution abatement program, Alan Wood Steel Co., Conshohocken, Pa., recently installed a water treatment works to comply with water purification regulations. The installation, built by United Engineers & Constructors Inc., Philadelphia, and costing over $775,000, provides for purification of 17,000 gpm of waste and river water, which is then recirculated to the plant.

The principal function of the system is removal of iron oxides (mill scale) and oil from the waste water of the company's blooming, plate and strip mills located on the Schuylkill River at Ivy Rock, Pa. Incidental to this, the treatment works also provides for neutralization of spent acid pickle liquors.

Sewer water from the mills first enters an oxide concentrator, as shown schematically in Fig. 1, where the bulk of the heavy iron oxide and oil are removed. Next, the waste water flows through an aerating system, followed by a mixing station at which river make-up water may be added as required for temperature reduction or volume control. Then the wastes pass into a Dorr clarifier for final clarification by gravity sedimentation, and are recirculated to the mill water supply system at the pumping station. Means are provided for chlorination of the raw river make-up water, if required.

The oxide concentrator consists of an open concrete tank about 91x20 ft and 12 ft deep, the bottom of which is shaped to form two troughs. Sets of mechanically operated scraper chains, shown in Fig. 3, move along the troughs at about 2 fpm and collect the mud and oxides that have settled in the bottom. The sediment is drawn up through extension chutes beyond the end of the concentrator tank, deposited in sludge receptacles and removed to a dumping area on the property.

Oil skimming weirs are installed near the outlet end of the concentrator. The outlet of these weirs is connected by a pipe through the wall to an oil sump at the pumping station.

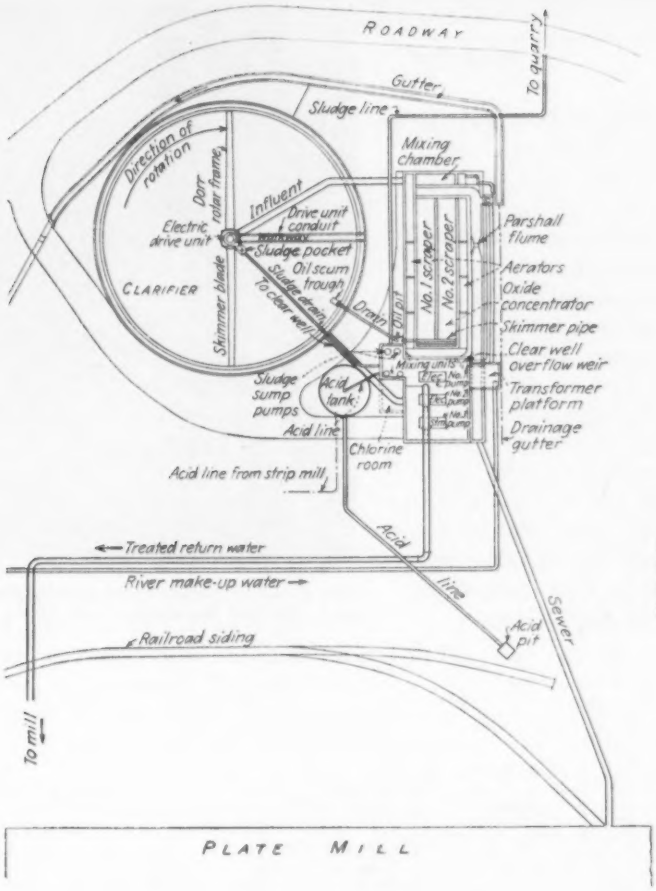


FIG. 1—Compact arrangement of the water treatment works, one of the first of this type to be used in the steel industry.

The Dorr clarifier is essentially a circular reinforced concrete tank, 125 ft ID with a side water depth of 13 ft, details of which may be seen in Fig. 2. The center driving mechanism supports and rotates a center cage having two rake arms attached. Waste water, flowing through the effluent pipe from the mixing chamber, enters the clarifier through the center column into the influent well, and overflows into the tank proper.

Scraping blades attached to the rake arms scrape the sludge that settles on the tank bottom to a sludge pocket at the center of the tank, from where it flows through a pipe to the sludge sump. Extensions from the rake arms support the oil skimmer. The skimmer revolves with the arm,



FIG. 2—The clarifier unit, with center column having rake arms and the oil skimming blade attached.

automatically collecting surface oil and scum to a point on the tank periphery. From this point, it is flushed into a scum trough, with a minimum discharge of water. A scum discharge pipe connects the trough to the oil pit, where facilities are provided for barreling the oil.

Flow of water to and from the clarifier is continuous, and retention time is from 35 to 40 min. The treated water overflows around the circumference of the tank and is run off to a clear water well, located beneath the pumping station.

Three complete pumping units are incorporated, each having a capacity of 8500 gpm. The two main service pumps are of the electrically driven, horizontal split case centrifugal type. Each is equipped with a 350 hp induction motor and driven at 1200 rpm. These are operated continuously for a 17,000 gpm output.

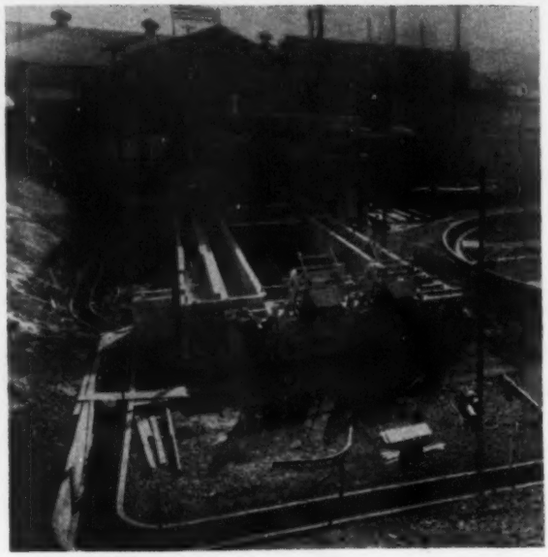


FIG. 3—Oxide concentrator, showing the aerating troughs on each side and the scraper units in the bottom of the tank.

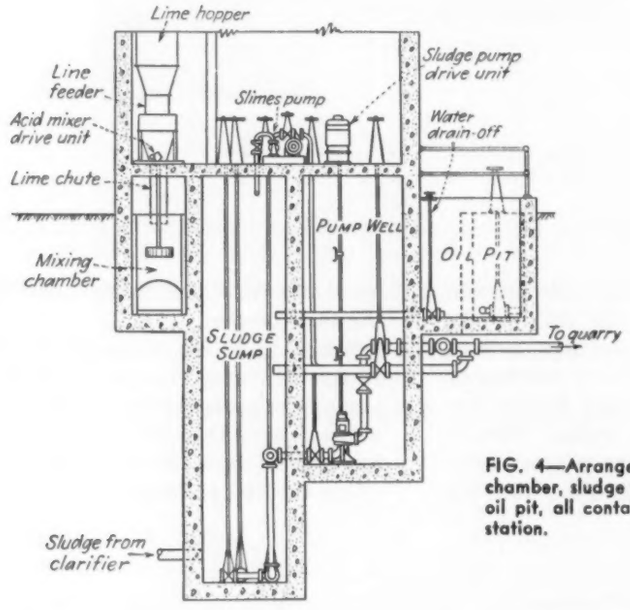


FIG. 4—Arrangement of the mixing chamber, sludge sump, pump well and oil pit, all contained in the pumping station.

One pump is a steam driven standby unit for use in the event of mechanical or power failure in the other pumps. The steam turbine unit is designed to deliver a minimum of 350 hp at the low speed gear shaft, at speeds up to 4500 rpm. The turbine is connected to the pump through a double helical reduction gear, reducing the speed to 1200 rpm. Treated water is drawn from the clear water well and pumped at 60 psi pressure to a 30-in. diam overhead header, which connects to the mill water supply system.

Spent acid pickle liquors from the Schuylkill Iron Works of Alan Wood are to be transferred by rail tank car to an acid sump located at the treatment works. The sump is in turn connected to a wooden acid tank of 30,000 gal capacity, which also receives acid wastes directly from the nearby strip mill.

Lime is stored overhead in the pumping station, from where it falls into a hopper above the mixing chamber. The acids flow into this chamber and are neutralized by the lime. The resulting sludge then goes into the sludge sump, wherein any additional water drain-off from the oil pit and sludge from the clarifier are also collected, as shown in Fig. 4. About 2000 gal per day of acid wastes may be treated in this manner.

Sludges from the treatment processes are pumped from the sludge well and discharged to an abandoned quarry on the premises.

Water is drawn from the river only to make up for losses and keep the system up to normal operating capacity. The clear water well is provided with an overflow to divert excess treated water to the river when the ready supply exceeds mill demands.

CHIPBOARD
Eliminates Corrosive Etching on Steel Sheets

CORROSIVE etching normally occurring on the bottom sheet of stacks of sheet steel resting on wooden skide and pallets can be eliminated through the use of a specially coated chipboard. This coated chipboard is made from pulpboard used in making paper boxes, and is manufactured in widths wide enough to cover the 4-in. side of 2 x 4 skids and in 4, 6, 8, and 10-ft lengths. Skids are prepared by laying the chipboard strips on top of the 4-in. side, bending the front and back edges over, and staple fastening.

In the manufacture of this prepared chipboard, after a sealer is applied to both sides, a waterproof, chemical-resistant coating is roll applied. This coating, known as the EHW formula, was developed by the E. H. Whitelock Co., Cleveland, as a protective coating for metal products.

Designed to prevent rust, corrosion, pitting, and tarnishing of metals, this transparent, colorless coating has served various industrial applications as a protective coating for metal parts in process, storage, or shipment and as a rust-preventive paint base.

Providing protection through only 0.0001 in. of thickness, the EHW formula is said to air dry, dust-free, in 2 min and to allow handling of coated parts after 5 min. Hardness and adhesive qualities of the coating after 4 to 8 hr drying at room temperature are claimed to be equal to baked enamel finishes. Manufacturer's tests have shown that it will withstand a 180° flat bend without chipping, cracking or peeling and that it is resistant to water, oils, greases, and chemicals when completely dry.

Coating the EHW formula onto a high grade of pulpboard has resulted in a new patented chipboard product that can eliminate corrosive etching on steel sheets in contact with resinous wooden skids, as proven by tests in various steel mills. Cooperation between steel plants and the Whitelock Co. have produced results showing that skids covered by EHW chipboard strips can support loads of 8 to 10 tons without the bottom steel sheet being etched by the resins, saps, or acids from the skids.

Chipboard covered skids at the Warren plant of Republic Steel Corp., where 8-ton stacks rested on 2 x 4's, and at their Corrigan-McKinney plant where the test load was 10 tons, showed that the strips prevented chemical corrosion of the bottom sheet and stopped weight indentation.

At the Steubenville plant of Wheeling Steel Co. an 8-ton load placed on covered skids passed the test. Another 8-ton stack loaded on the same skids sat for the duration of the strike with no etching through. Other tests have been run at Inland Steel, Youngstown Sheet & Tube, and Jones & Laughlin, with loads as high as 30 tons being tested at the latter. Tests such as these indicate that chemical etching and weight indentation causing the bottom sheet to be thrown away soon may be eliminated.

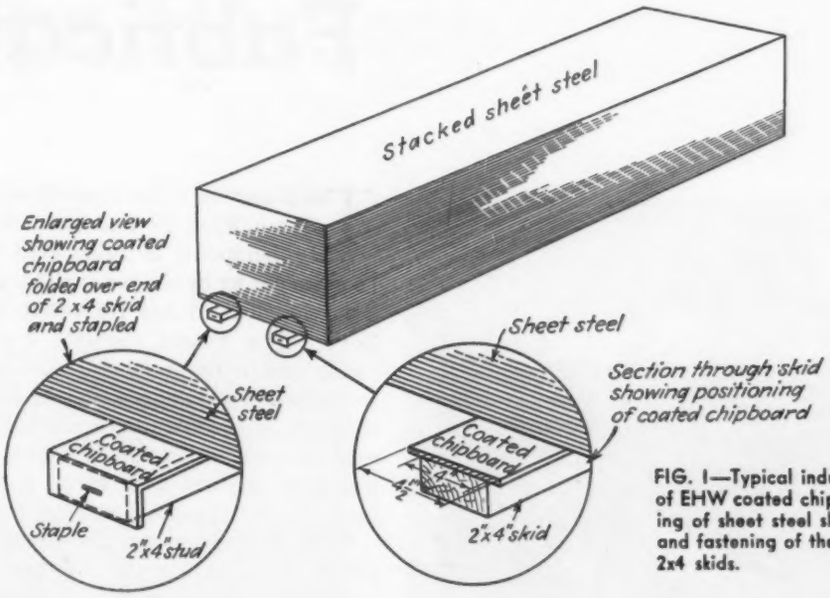


FIG. 1—Typical industrial application of EHW coated chipboard—the stacking of sheet steel showing positioning and fastening of the chipboard to the 2x4 skids.



1 The two cast aluminum sections of the Safe-Air heater, held and positioned as shown above, are being welded by the manual Aircomatic process. The wire reel and drive roll box can be seen in the right background. Wire size used is 1/16 in. diam, 43S aluminum alloy.

Aircomatic Fabrication

THE Safe-Air Gas Home Heater, made by the South Wind Div. of Stewart-Warner Corp., Indianapolis, is fabricated at the rate of 12 units per hr by the manual Aircomatic process, a development of Air Reduction Sales Co., New York. The heater consists essentially of an upper and a lower combustion chamber, which are joined together by a square butt weld around the periphery. Originally the halves were bolted together and sealed with a gasket, a method that was later discarded in favor of welding by the inert-gas, shielded-arc welding process.

With the advent of the Aircomatic gun, the possibility of using this method of fabrication was considered, providing the process could successfully weld Alcoa aluminum sandcasting Alloy No. 108, from which the halves of the heater were cast.

After experimentation at the Murray Hill Laboratories of Air Reduction, the Aircomatic gun technique was proved feasible. The accompanying illustrations show the details of the process as finally evolved, and outline some of the factors involved in this welding operation.



3 The completed weld along one side of the heater is shown here. Welding speed for this operation is 24 ipm, wire feed is 180 ipm, and the gas envelope is Grade A Helium (XX).

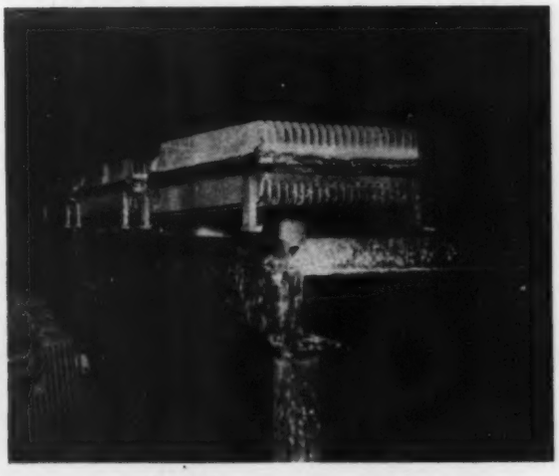


2 These two sections of the heater are joined with a square butt weld, ½ in. thick, with weld penetration of ¼ in.

of Gas Heaters



4 Two heating units are shown here completely welded. Current required is 160 amp, reversed polarity, at 30 volts. Gas requirements total 30 cu ft per hr.



5 Three finished units are shown here on a conveyer that carries them to storage. Completed units are tested for leaks at 15 psi pressure. By inert-gas, shielded-arc welding, production was 7 units per hr, a rate that has been increased to 12 per hr in using Aircomatic.

Aluminum Single Arch Span at Arvida



Completion of the arch of the all aluminum bridge at Arvida, Quebec, October, 1949.



Handling the light sections.



Foundation and structural design of dural girders and beams used in the erection of one of the approaches.

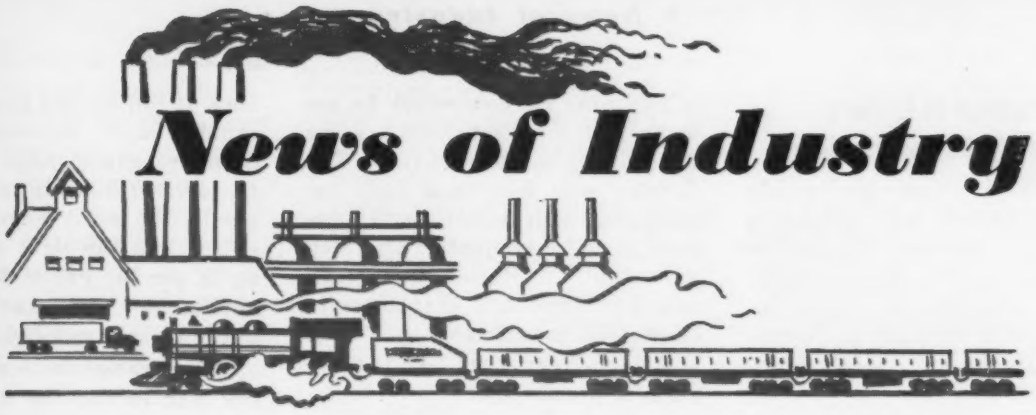
First half of the 290 ft arch span being erected by workmen of the Dominion Bridge Co.

A SINGLE arch span built entirely of dural type aluminum alloys and believed to be the first structure of its type in the world, is nearing completion at Arvida, Quebec.

The bridge, fabricated by Dominion Bridge Co. Ltd., Lachine, Quebec, has an overall length of 504 ft from abutment to abutment and will have an overall weight of 380,000 lb in comparison with a weight of 875,000 lb for a similar structure of steel.

The bridge consists of a single 290 ft arch span with approaches, the main arch section being composed of two aluminum web plates, four angles, and two cover plates forming a closed box section 54x32 in. Specified live load is two 20-ton trucks abreast, or the equivalent.

Since the dural alloys are essentially corrosion resistant, no painting will be necessary and maintenance will be practically negligible.



Special Report

New York—Selling Welfare ENTERPRISE is the only way to halt the trend toward the Welfare STATE.

A growing group of enlightened management recognize this. By trial and error, they have learned that an effective educational program is the key to any management program aimed at improving human relations.

What do your workers want? What is your company doing to meet these wants? How effective is your company's program? If you are interested in the answers to these questions, don't miss THE IRON AGE Special Report, "Selling Welfare Enterprise," on page 67.

AIEE to Hold Electric Welding Conference in Detroit

Detroit—New welding processes and techniques will be discussed and demonstrated at the second American Institute of Electrical Engineers' conference on electric welding to be held April 5, 6 and 7 at the Rackham Bldg., Detroit.

Mechanical rectifier arc welders, submerged arc welding, stud welding, gas welding and high frequency induction welding are among the processes and equipment to be described.

New data on voltage dip effects and voltage drop interference between welders will be available. A technical session on power supply will consider welder feeder systems and the use of series capacitors at main transformer primaries.

Aluminum Foil Industry Expands Rapidly

Demand is sufficient to absorb increased capacity . . . Food packaging industry offers largest single potential market . . . Costs lowered and quality increased.—*by JOHN ANTHONY.*

New York—The aluminum foil industry is a business on its way up. Business is thriving now, and there are many new products underway whose potential may be tremendous even if only a few of them click.

Profits are slim in the foil business due to intense competition. Buyers are very critical of quality, particularly in the lighter gages. Scrap losses can pile up quickly due to minor and very often unpredictable causes.

New producers have been entering the business freely in the postwar period. But growing demand has been sufficient to absorb the new capacity. One producer new to the field told THE IRON AGE that this is no business for anyone without foil rolling experience to enter. The cost of experience comes high, even with the aid of skilled foil rollers.

Expansion Began After the War

Foil rolling is an art that has been reduced to scientific principles. Every producer has developed standard practices, as to coating oil, roll pressures, mill speeds, annealing time and temperatures, etc. These are carefully concealed from the competition. But the time when there were any really secret processes unknown to the bulk of the industry has long since passed.

The aluminum foil industry got underway in this country in the 1920's, in competition with tin and lead foils. But the real expansion in the industry didn't develop until after the end of the war.

Reynolds Metals Co. is considered generally by the industry to be the leading foil producer. The company is unique as a fully integrated foil producer whose facilities include those of the converter

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Inland Approves Pension Plans

Chicago—Stockholders of Inland Steel Co. voted at a special meeting to approve the two employee's pension plans included in the company's strike settlement with the United Steelworkers of America—CIO. Approval was voted by 74.9 pct of the total stock outstanding. The two pension plans will be put into effect Mar. 1. Inland employees will have a choice between the plans, one a non-contributory plan similar to the so-called "Bethlehem Plan," the other a contributory plan which Inland first put into effect in 1936.

MFS Conference to Explore Sales and Marketing Problems

Cleveland—The Malleable Founders' Society will sponsor a Market Development Conference at Evanston, Ill., March 22-23, 1950, in cooperation with the Technological Institute of Northwestern University, MFS headquarters announced.

Executives and salesmen from MFS member companies are expected to attend the two-day session, at which the sales and marketing problems of the industry will be explored. Authorities on metallurgy, design, sales techniques, and other pertinent topics, will address the group.

Foil Industry Expands

Continued from Page 95

—the customer of the industry who laminates foil with paper for some purposes and operates printing plants, for foil and paper. Through its integrated operation, Reynolds has done much to promote foil and foil products.

The Aluminum Co. of America is another major producer of foil, having expanded and modernized several of its foil plants since the end of the war. Its new installation at Alcoa, Tenn., includes 60 in. mills on which foil up to 52 in. wide can be produced.

Market Largely in the East

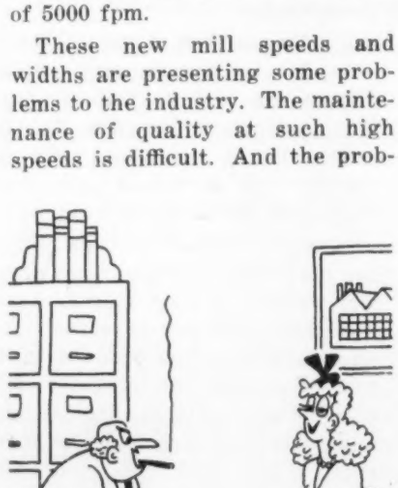
Newcomers to the field include Aluminum Foils, Inc., New York, a Swiss producer who has completed a plant at Jackson, Tenn., and expects to begin operations in about a month; Kaiser Aluminum & Chemical Corp., which bought a German foil mill and is operating it at Permanente, Calif.; Republic Foil & Metal Mills, Inc., Danbury, Conn., who began operations several years ago; and Stranahan Foil Co., Inc., Hackensack, N. J., who has all but cornered the condenser foil field.

The market for foil is largely confined to the East, where most converters are located. In selling to the eastern market, Kaiser must absorb freight. But the company is encouraging converters to set up shop on the West Coast to serve the growing foil market there. The German mill has been fully re-equipped with motors and controls to improve quality and step up output. A Kaiser spokesman told THE IRON AGE that capacity of the mill is estimated at 10 million lb per year when 3-shift operation is practicable.

Producers are moving to lower production costs and assure quality by installing new mills with higher speeds and wider rolls. Converters want wider foil so they can slit to width and save on scrap losses. The foil rolled near the roll ends is not of uniform quality and is unsuitable for some foil rolling applications.

Not so long ago 24 in. foil produced on 30 in. mills was virtually standard in the industry. Many of the new mills are 48 and 60 in. wide, producing foil of 42 and 52 in. Some of the new mill installations are designed for speeds of 2500 and 3000 fpm. One new installation is designed for a speed of 5000 fpm.

These new mill speeds and widths are presenting some problems to the industry. The maintenance of quality at such high speeds is difficult. And the problems of rolling foil gages multiply rapidly with increasing width. Standard gages range from 0.005 in. to 0.00023 in. In terms of area per lb, the heavy gage takes 2050 sq in., and the light gage, 44,600 sq in. per lb. For some electronic applications foil has been produced as thin as 0.00017 in.



"The secretary I had in mind must be experienced, efficient, reliable—but you'll do."

Prices range from about 35¢ to 40¢ per lb for the heaviest foil gages up to about 70¢ for the lightest standard gages. Lighter gages, and foil of special quality for condenser or other electronic applications may range up to $1.50 per lb. Production difficulties increase very rapidly with reductions in gage.

Foil Doubles Freezer Capacity

The industry's bread and butter has long been tied to markets using foil for protective purposes, such as a moisture barrier. Perhaps the biggest markets of this type have been the cigarette and chewing gum wrappers.

Food packaging is another major market and offers perhaps the biggest potential of any. Foil offers the advantage of appearance, as well as protection. For frozen foods, the use of foil offers the economic advantage of doubling freezer capacity. Foil milk bottle caps are already in wide use. Foil wrappers for butter and margarine are going strong.

Packaging Technique Studied

The cost of promoting some of these markets is very high. Take the household foil package. Advertising and promotion costs must be absorbed in the price of the product. But the industry does not expect to compete with wax paper on a price basis. Users of foil will probably continue to use wax paper. This market is large now. But as more and more housewives become familiar with the advantages of foil, the market should increase tremendously.

The use of foil for packaging often involves the use of new techniques for which present equipment is not suited. Modification of existing equipment or the development of entirely new pack-

aging machinery is sometimes involved. The cost to packers is a serious deterrent in many cases. But foilmakers are studying new packaging techniques that may solve some of these problems. The tray style food pack is one solution which is already in use for such foods as cheese and beans.

Foil packaging may make use of laminated combinations of foil and paper, as in the food bags now being used for dehydrated soups, as well as the plain foil packages. Several methods of sealing have been developed. Reyseal combines foil and wax tissue so that sealing may be done at low temperature. Another technique involving the use of a thermoplastic coating on foil can also be heat sealed.

As a whole the outlook for the industry is very promising. Foil packed products present a very favorable appearance and maintain it under conditions of soil and grease. There is no doubt that the foil industry is on its way to greater production.

Resume Your Reading on Page 95

Lubrication Research Cuts Costs

Standardization and simplified purchasing result from research recommendations . . . Metalworking plants set pace in lubrication research—*by JOHN DELANEY*

Pittsburgh — Top management, pressing for every possible opportunity of cutting costs, is turning a critical eye on the oils and greases that lubricate production machinery. Metal producing and metalworking plants are setting the pace in lubrication research.

Educators are encouraging student interest in lubrication engineering as a career. Eight schools are offering post-graduate courses that should provide the best possible background for a career in this field. The degree awarded will be Master of Science undesignated, or its equivalent. Since there are no lubrication engineering departments in the country's universities, it will not be possible to offer the degree of Lubrication Engineer. Professional standards are being promoted by the American Society of Lubrication Engineers, which will hold its fifth annual meeting in Detroit this April.

$1 Million Saving Reported

Companies that have been conducting research into the problem are finding that there is a tremendous opportunity to increase operating efficiency by determining the correct lubricants for their operations and by standardizing on types of lubricants purchased.

This is a comparatively new approach. Lubrication engineers say that formerly industry usually accepted recommended oils and greases without giving much thought as to whether a given lubricant, while excellent in itself, was necessarily the best for a specific operation. In effect, it amounted to a misapplication of available lubricants, which are almost uniformly good.

One large nonferrous metals producer, a leader in lubrication research, estimates that it is saving about $1 million a year by the proper application of available lubricants to its operations.

Companies engaged in lubrication research include General Electric, Westinghouse, Aluminum Co. of America, Ford, and major steel producers.

Lubrication Problems Solved

The probable leader as far as research facilities are concerned is Alcoa, which has set up a modern lubrication research laboratory at New Kensington, Pa., operated by a staff of 20 under the direct supervision of Dr. E. M. Kipp, chief of Alcoa's extensive lubrication research division.

The Alcoa lubrication lab, in cooperation with other companies, has tackled and solved lubricating problems and made recommendations that have led to greater operating efficiencies.

Recommendations of the lubrication team have also brought standardization and order in the purchase of lubricants.

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Chicago Firm Forms New Company

Hamilton, Ont.—Taylor Forge & Pipe Works of Canada Ltd., formed by Taylor Forge & Pipe Works Inc., Chicago, will erect a plant on a 10-acre site here. It plans to have the new plant in operation by next June.

FLOOD OF LUBRICANT: Lubricant being sprayed to facilitate rolling as aluminum slab enters a continuous mill at the North Plant, Alcoa, Tenn. Works of the Aluminum Co. of America.



INDUSTRIAL SHORTS

BEST WISHES!—JOS. DYSON & SONS, INC., Cleveland, recently celebrated their eightieth anniversary. The company produces flat die and hydraulic press forgings.

NEW FABRICATOR — A new company, GREAT LAKES SPLICING & SUPPLY CO., has been formed in Euclid, Ohio, which will fabricate all types of wire rope slings, fittings and other cable assemblies. James R. Bryant is president and David T. Hutton, vice-president and treasurer. The company is an authorized distributor of wire rope made by American Steel & Wire Co.

COMBINE OPERATIONS—All operations of the CINCINNATI PLANER CO., Cincinnati, will be moved to Fond du Lac, Wis., and absorbed by the parent organization, the Giddings & Lewis Machine Tool Co. Operations have been combined to reduce general operating costs and provide more extensive engineering and research facilities.

PURCHASE—The Harvey Mfg. Co., Racine, Wis., producers of drop forgings, farm equipment and wagon hardware, has been purchased by FARM TOOLS, INC., Mansfield, Ohio.

LARGER QUARTERS — The metal warehouse in Rochester of the FOLLANSBEE STEEL CORP., Pittsburgh, is being moved to larger quarters. The floor space will be increased by 75 pct and the storage by 350 pct.

SERVING THE WEST—Production of Carborundum silicon carbide has been started by the CARBORUNDUM CO. in a new plant in Vancouver, Wash., costing over $2 million. J. L. Bergman is plant superintendent; A. C. Knapp, plant engineer; and E. E. Einhorn, office manager.

HEADS GROUP — Philip A. Norton, sales manager of Wisconsin Motor Corp., Milwaukee, has been elected president of the INTERNAL COMBUSTION ENGINE INSTITUTE at their recent meeting.

DRAVO TO BUILD — A contract has been awarded to the DRAVO CORP., Pittsburgh, for the manufacture and installation of two ore-handling machines and a belt conveying system to be installed in the new $5 million ore pier of the Baltimore & Ohio R. R. at Baltimore.

POWDER METALLURGY — John D. Shaw, Walter V. Knopp and Catherine L. Clark have announced the formation of S-K-C RESEARCH ASSOCIATES with laboratories at 445 Fifth Ave., Paterson, N. J. for research, technical consultation and development in powder metallurgy, process and plant design and mechanical, chemical and metallurgical engineering.

DIRECTS AISI UNIT — Greswold Van Dyke has been appointed executive director of STAINLESS STEEL PRODUCERS — AMERICAN IRON & STEEL INSTITUTE, New York, an organization for further development of uses of stainless steel, made up of a group of 17 leading producers and suppliers.

PRESS AGENT—E. W. Bliss Co., Toledo, has appointed the WEGNER MACHINERY CORP., Long Island City, N. Y., as exclusive representative for their line of mechanical and hydraulic presses in southeastern New York State, the northern half of New Jersey and northeastern Pennsylvania.

SOUTHWESTERN OFFICE—The WHITING CORP. of Harvey, Ill., and Los Angeles, has opened its own district sales office in the M & M Bldg., Houston. Elmore C. Brown has been appointed district manager.

Lubrication Lab Cuts Costs

Continued from Page 97

For example, the company at one time purchased at least 850 different mechanical lubricants; now the number is down to 120, and probably will be reduced still further. Only six basic types of oils, generally in not more than three to six viscosity grades, are purchased.

Alcoa formerly purchased 125 different greases, but standardization possibilities indicate only about six different types in the future; crankcase oils purchased used to involve 70 different grades of varying quality, now the company has standardized on Army-Navy 2-104B in four different viscosity grades; gear lubricants used to number about 50 of various kinds, now Army-Navy 2-105B in four or five viscosities is the standard grade.

Cost Per Gallon Reduced

In addition, Alcoa's overall cost per gallon of lubricant has been considerably reduced.

Alcoa's belief that lubrication engineering is a common meeting ground for other engineering branches within the company is reflected in the makeup of the Central Oils and Lubricants Committee, the policy-making group on lubrication research and materials purchasing.

Chairman of the committee is the assistant general purchasing agent. Serving with him are the lubrication research laboratory representative, the chief mechanical engineer, the chief fabricating metallurgist, the chief metallurgist of the forgings and castings division, the chief engineer of Alcoa Mining Co., the assistant manager of the reduction division, the assistant manager of the fabrication division, and the chief technical representatives of the ore plants.

A lubrication committee in each plant includes, in most instances, the chief plant metallurgist, the chief engineer, and a representative of the purchasing department. It is comprised of three men.

Resume Your Reading on Page 97

Australian Manufacturers To Enter Automobile Industry

Washington—Three new automobiles, although largely in the planning stage, are under consideration by Australian manufacturers, according to the Office of Domestic Commerce.

Hartnett Motors of Melbourne is presently engaged in raising about $1 million for the enterprise. The firm already owns considerable tooling and equipment which it would farm out to shops in Great Britain for making components. Actual assembly would be carried out by distributors in Australia. The car would be a four-passenger vehicle priced a little less than $1,000.

Second of the proposed cars is a three-wheeled vehicle, sponsored by the Jeffress Brothers of Brisbane. Pilot models featuring hydraulic transmission, front wheel drive, and a laterally suspended 5 hp motor have been made.

Wiles Mfg. Co. of Adelaide has produced a light car which will be similar to the German DKW. However, no definite steps have been taken toward financing the venture or placing orders for new factory equipment.

Crucible Sales Executives Meet

Pittsburgh—A four-day meeting of Crucible Steel Co. sales executives representing all branch offices, headquarters offices and plants was held here recently. It was the first meeting of national scope since the war.

Sixty-five Crucible sales officials participated in the meeting, which was under the direction of W. H. Wiewel, vice president in charge of the sales department.

Hudson to Make Cars in Canada

Tilbury, Ont.—Chatco Steel Products Ltd. has completed an agreement with Hudson Motor Car Co. for the production of Hudson cars in its plant here. The plant is currently operating at 50 pct capacity on the company's own products. Tooling for the Hudson cars is underway and it is expected that production will start around the middle of April.

Chatco manufactures products of Chrysler Corp., such as heating and air conditioning equipment, under contract in Canada. Truck bodies, farm implements and air furnaces also are produced by Chatco Steel Products.

Olds Sales Reach New High

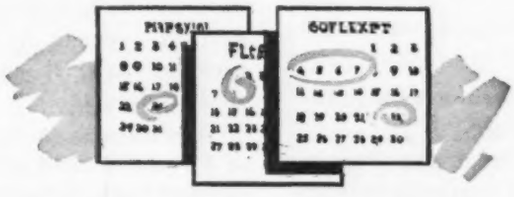
Detroit—Retail sales of new Oldsmobiles during January broke all previous records, exceeding January 1949 total by 37 pct. During the final 10 days of January, Oldsmobile dealers delivered 11,134 new cars to customers, the largest number for any 10-day period since May 1941.

Semi-Smokeless Coal Beds Found Under Existing Fields

Washington—New coal reserves, estimated at about 600 million tons of semi-smokeless, have been found in the Georges Creek field of western Maryland, it is reported by the Bureau of Mines.

Georges Creek, one of the older fields, has consisted of two main beds which have been producing less and less coal annually over the past 15 years. The new discovery consists of ten beds beneath those now being worked.

Although the new coal ranks as low volatile, tests indicate a yield of strong coke, the Bureau reports, and some of the coal may be blended in order to produce metallurgical coke.



Dates to Remember

• HELP THE HEART FUND •

Feb. 27-Mar. 3	**American Society for Testing Materials**, spring meeting, Pittsburgh.
Mar. 14-16	**Society of Automotive Engineers**, passenger car, body and production meeting, Detroit.
Mar. 16-17	**Pressed Metal Institute**, technical symposium, Cleveland.
Mar. 20-25	**Concrete Reinforcing Steel Institute**, annual meeting, Houston.
Mar. 21-22	**Steel Founders' Society of America**, annual meeting, Chicago.
Apr. 3-4	**Assn. of Iron & Steel Engineers**, spring conference, Birmingham.
Apr. 4	**Society for Applied Spectroscopy**, meeting, New York.
Apr. 4-7	**National Assn. of Corrosion Engineers**, annual conference, St. Louis.
Apr. 4-8	**Chicago Technical Societies Council**, national production exposition, Chicago.
Apr. 5-7	**American Institute of Electrical Engineers**, conference on electric welding, Detroit.
Apr. 5-7	**Midwest Power Conference**, Chicago.
Apr. 10-12	**American Institute of Mining & Metallurgical Engineers**, annual openhearth, blast furnace, coke oven and raw materials conference, Cincinnati.
Apr. 10-12	**American Society of Lubrication Engineers**, annual convention, Detroit.
Apr. 10-14	**American Society of Tool Engineers**, industrial cost-cutting exposition, Philadelphia.
Apr. 11-12	**American Zinc Institute**, annual meeting, St. Louis.
Apr. 12-14	**American Society of Mechanical Engineers**, spring meeting, Washington.
Apr. 12-14	**National Petroleum Assn.**, semiannual meeting, Cleveland.
Apr. 24	**Packaging Machinery Manufacturers Institute**, semiannual meeting, Chicago.
Apr. 25-26	**Metal Powder Assn.**, annual metal powder show, Detroit.
Apr. 27-28	**American Steel Warehouse Assn.**, annual meeting, Houston.

FTC Opinion Divided On Legality of Freight Absorption

Ten smaller steel companies urge Commission to accept Paulson order.

Washington — Sharply-divided opinion within the Federal Trade Commission as to the legality of freight absorption was brought to a focus this week as government and industry attorneys argued the merits of delivered price selling before FTC members.

Lawyers for U. S. Steel Corp. and Republic Steel Corp. told the commission they would abide by the provisions of a proposed order offered by the steel industry banning the use of multiple basing point systems. This order, drafted in cooperation with FTC attorney Lynn Paulson (THE IRON AGE, Dec. 8, 1949), is designed to permit freight absorption on an individual basis.

Calls Paulson Order Ambiguous

Corwin Edwards, FTC economist, charged that the Paulson order would not prevent a resumption of multiple basing point selling. He declared there were so many ambiguities in the proposed order that enforcement of the order would "actually encourage" a return to the practices FTC has sought for the past two years to eliminate. "The order would not prevent the resumption of the conspiracy," he stated.

Paulson, on the other hand, said he was seeking to bring about "both competition and freight absorption." He said the proposed order had been drafted in such a way as to make it possible for any steel mill to sell in its own territory and at the same time be free to invade another mill's territory.

"All we want to do is to get the steel industry to establish a plant price at every plant," he declared.

John Bane, counsel for 10 smaller steel companies named in the government's suit, urged members of the commission to accept the proposed order.

Japan's Steel Industry Needs Modernizing

American observers report obsolete methods still in use . . . Japanese seen years behind U. S. industry but show eagerness for improvement . . . Recommendations are listed.

Pittsburgh—Japan's steel industry is going to have a long, hard row to hoe before it can expect to compete in a peacetime economy against more efficient steel producers.

This was one of the conclusions of Edward W. Hill of Loftus Engineering Corp., after a four-month study of the Japanese steel picture at the request of the U. S. Army. Fred N. Hays and James T. McLeod, both of Carnegie-Illinois Steel Corp., assisted Mr. Hill in the study.

Financial Burden

Purpose of the visit was to make recommendations for greater productive efficiency with the hope that Japanese steel producers may more quickly stand on their own feet without financial aid from the U. S.

Mr. Hill found that, due to their

STEEL PRODUCTION

(Ingots and Steel for Castings)
As Reported to American Iron & Steel Institute

Period	OPEN HEARTH Net Tons	OPEN HEARTH Percent of Capacity	BESSEMER Net Tons	BESSEMER Percent of Capacity	ELECTRIC Net Tons	ELECTRIC Percent of Capacity	TOTAL Net Tons	TOTAL Percent of Capacity	Calculated Weekly Production (Net Tons)	Number of Weeks in Month
† January, 1950	7,111,201	96.2	379,252	80.6	414,132	70.9	7,904,585	93.6	1,784,331	4.43
January...1949	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.43
February	6,633,779	102.0	379,698	95.3	467,247	99.6	7,480,724	101.4	1,870,181	4.00
March	7,473,901	103.7	430,176	97.5	483,850	93.2	8,387,927	102.7	1,893,437	4.43
1st Quarter	21,395,383	102.3	1,218,426	95.2	1,438,357	95.4	24,052,146	101.5	1,870,307	12.86
April	7,015,611	100.5	404,095	94.6	365,570	72.7	7,785,276	98.4	1,814,750	4.29
May	6,889,230	95.6	400,741	90.9	299,751	57.7	7,589,722	92.9	1,713,256	4.43
June	5,954,619	85.3	349,196	81.8	194,386	38.6	6,498,201	82.2	1,514,732	4.29
2nd Quarter	19,859,460	93.8	1,154,032	89.1	859,707	56.4	21,873,199	91.2	1,681,260	13.01
1st 6 months	41,254,823	98.0	2,372,458	92.1	2,298,064	75.8	45,925,345	96.3	1,775,236	25.87
July	5,307,471	73.8	300,236	68.2	171,415	33.1	5,779,122	70.9	1,307,494	4.42
August	6,101,499	84.7	355,335	80.6	257,910	49.7	6,714,744	82.2	1,515,744	4.43
September	5,992,308	86.1	350,282	82.2	247,601	49.3	6,590,189	83.5	1,539,764	4.28
3rd Quarter	17,401,276	81.5	1,005,853	76.9	676,926	44.0	19,084,055	78.8	1,453,470	13.13
9 months	59,656,099	92.5	3,378,311	87.0	2,974,990	65.1	65,009,400	90.4	1,666,908	39.00
October	814,374	11.3	.....	....	111,059	21.4	925,433	11.3	208,901	4.43
November	3,805,730	54.5	172,270	40.3	238,262	47.4	4,216,262	53.3	982,812	4.29
* December	6,951,572	96.7	396,075	90.0	369,611	71.3	7,717,258	94.7	1,745,986	4.42
* 4th Quarter	11,571,676	54.1	568,345	43.4	718,932	46.7	12,858,953	53.1	978,611	13.14
* 2nd 6 months	28,972,952	67.8	1,574,198	60.2	1,395,858	45.3	31,943,008	68.0	1,215,950	26.27
* Total	70,227,775	82.8	3,946,656	76.0	3,693,922	60.4	77,868,353	81.0	1,493,448	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,668,287 net tons open hearth, 106,195 net tons Bessemer and 131,786 net tons electric ingots and steel for castings, total 1,906,268 net tons; based on annual capacities as of January 1, 1950, as follows: Open hearth 86,984,490 net tons, Bessemer 5,537,000 net tons, Electric 6,871,310 net tons, total 99, 392,800 net tons.
† Preliminary figures, subject to revision.

Note—The percentages of capacity operated are calculated on weekly capacities of 1,526,717 net tons open hearth, 99,559 net tons Bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of January 1, 1949, as follows: Open hearth 84,817,040 net tons, Bessemer 5,191,000 net tons, Electric 6,112,890 net tons, total 96,120,930 net tons.
* Revised.

self-imposed isolation, Japanese steel people were years behind the United States in the adoption of more efficient practices. However, they were eager to adopt the suggestions of the American experts and, to get a first-hand view of our operating methods, a group of Japanese steel men was scheduled to arrive here late this month for a two-month tour of steel plants.

List Seven Recommendations

Some of the recommendations for stepping up Japanese steel production included (1) concentration of ingot production in integrated plants; (2) use of tar and coke oven gas as openhearth fuel to replace producer gas and foreign purchases of oil; (3) a careful system of scrap identification and segregation to avoid alloy contamination; (4) encouragement of proper maintenance and modernization by prompt elimination of the threat of losing equipment now marked for reparation; (5) no further capital expenditures for hand fed sheet and tin plate mills; (6) government control to assure fair distribution of semi-finished steel once ingot production is concentrated in integrated mills; (7) concentration of plate production at Hirahota and shutdown of plate mills too slow to roll final reductions at proper finishing temperatures.

Standard Steel Buys Drying Machinery Division

Los Angeles—Standard Steel Corp. has purchased the drying machinery division of the Hersey Mfg. Co. of Boston, Mass., and manufacturing processes will be carried out in that city and Los Angeles. Standard Steel is a steel fabricator and Hersey is a manufacturer of dehydration machinery equipment.

Monarch Declares Dividend

Sidney, Ohio—Directors of Monarch Machine Tool Co. declared a dividend of 50 cents per share, recently, payable March 1, 1950, to shareholders of record at the close of business on Feb. 18, 1950.

Tool and Die Business Seen Improving

Business is still spotty . . . But television and auto transmissions help drive the blues away . . . An informal dinner acquaints members with their Congressmen.

Cleveland—Encouraging reports as to the business outlook were given by trustees of National Tool & Die Manufacturers Assn. from widely scattered areas, including New York, Providence, Detroit and St. Louis, at their recent meeting in Washington, according to George S. Eaton, NMTDA executive secretary.

Government Orders Priced Low

Others emphasized that orders were still scarce and that shipments were running much the same as in late 1949, when they were about 85 pct of the previous year, he said.

Television is still producing good business for eastern tool and die shops interested in that field, and new automobile transmissions and engines are helping the outlook in the Detroit area especially.

Small volume of orders placed for tooling or development work for the rearmament program has been disappointing to major segments of the tool and die industry, Mr. Eaton declared.

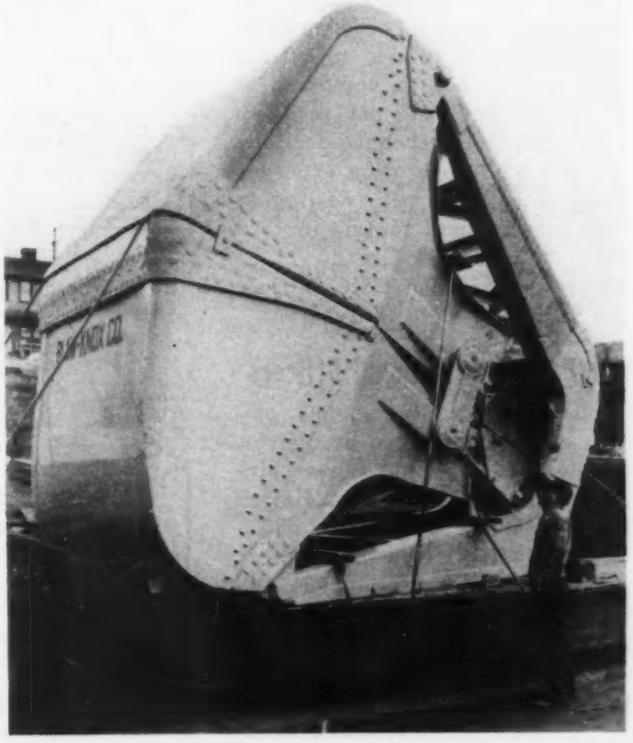
Aircraft companies and other firms with large prime contracts apparently are producing most of the special tooling required, in their own tool rooms, but there is some reason to believe more will be let out as these programs become further advanced.

Equally disappointing are the very low prices at which govern-

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Award Army Parts Contracts

Washington—New Army contracts include orders to United Auto Parts Co. of Kansas City for 675 80-by-144 in. steel cargo bodies for $219,375. A contract was also awarded to Willys-Overland Motors, Inc., for $132,678 worth of spare parts.



BIG BUCKET: This is the largest clamshell bucket ever shipped by the Blaw-Knox Co., Pittsburgh, in fully assembled form. Destined to unload coal from water craft on the Chesapeake Bay, the bucket can fill a railroad coal car in three bites. Its capacity is 17 tons, it weighs 32,000 lb, and is 21 ft long opened.

U.S. Funds Aid Development Of Mines in French West Africa

Washington — About $500,000 worth of Marshall Plan aid, largely in the form of machinery and heavy equipment, has been shipped into the Conakry area of French West Africa to aid development of iron ore deposits and phosphate mines.

In all, nearly $11 million worth of American equipment has been shipped into French West Africa for development of industrial and agricultural resources.

In addition to several million for tractors, graders, peanut pickers and irrigation and drainage equipment, about $1.5 million worth of transportation and communication machinery and equipment has been shipped.

Marshall Plan financing has also been provided for diesel-electric locomotives for the Dakar-Niger R.R. and machinery for the Bamake air field.

R.R. Incomes Decline in '49

Washington—The net income of Class I railroads amounted to an estimated $436 million during 1949. This is below the 1948 net income figure of $698 million. Net operating income was $686 million, representing a return on investment of 2.91 pct, as compared to $1 billion and 4.38 pct in 1948. Total operating revenues declined 11.3 pct while operating expenses dropped only 7.8 pct. Failing to earn interest and rentals in 1949 were 23 Class I railroads, 11 of which were in the East, four in the South and eight in the West.

NSMPA Elects Regional Officers

Cleveland—New regional officers have been elected by district chapters of National Screw Machine Products Assn., according to Orrin B. Werntz, executive secretary of NSMPA. New officers are:

Wisconsin: Chairman, E. A. Bartelein, Western Machine Co., Milwaukee.

Northern Illinois and Northern Indiana: Chairman, E. W. Schneider, Hudson Screw Machine Products Co., Chicago, and vice-chairman, A. S. Farruggio, Reliable Screw Machine Products Co., Chicago.

Michigan: Chairman, Ernest Hunt, Holt Products Co., Holt, Mich.; vice-chairman, William S. Boehm, B. & O. Screw Products Co., Detroit.

Northern Ohio: Chairman, E. C. Sinclair, Locke Machine Co., Cleveland; vice-chairman, George Sprague, National Acme Co., Cleveland, and program chairman, J. G. Wagner, Western Automatic Machine Screw Co., Elyria.

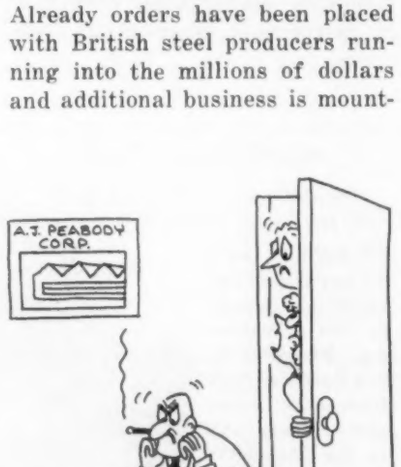
Western New York: Chairman, Harry G. Smith, Curtis Screw Co., Buffalo; vice-chairman, George M. Glauber, David Bell Co., Inc., Buffalo, and secretary, Charles B. Jones, Lucas Screw Co., Rochester.

Coal Strike Lowers Canadian Steel Orders

Uncertainty regarding deliveries throws greater volume of orders to Canadian mills . . . Demand higher for British steel . . . Canada discontinues import restrictions.

Toronto—Uncertainty regarding future steel deliveries from the United States, due to labor troubles at the coal mines, is throwing a greater volume of orders to Canadian steel mills from consumers that formerly placed orders across the line.

This uncertainty is also reflected in substantially higher demand for British steel in Canadian markets. Already orders have been placed with British steel producers running into the millions of dollars and additional business is mounting rapidly. At present, however, much of the orders going across the ocean are for heavier types of steel, but they also include galvanized sheets, which are in short supply in Canada.



"See? It wouldn't be a good idea to call on him. He just paid his income tax."

Consumers Will Pay More

Recent price adjustments by Canadian steel producers mean that most consumers will pay more for steel from the U. S. and Canada. This is creating greater interest in steel from Great Britain, where steelmakers have the advantage of the devalued sterling. On the other hand, some local steel men state that while British steel may offer real competition in coastal areas and even as far in as Montreal, they believe that even with the price advantage, domestic steel will be as cheap or cheaper when the additional freight into Ontario and Western Canada is taken into consideration.

Whatever facts may eventually prove, it is certain that British steel interests are gaining a strong footing in the Canadian markets, so far mostly at the expense of U. S. imports.

Canada has discontinued restrictions on imports of iron and steel, as well as on a long list of finished products of which iron and steel are the principal components. This may tend to stimulate sales of foreign products in this market. Most countries will

benefit from the withdrawal of imports restrictions, which were set up to save U. S. dollars.

Steel Demand Booming

Insofar as Canadian mills are concerned, the demand for steel is booming. Producers have opened books for the second quarter and already bookings will absorb most of the output to the end of June. As was the case in the first quarter, demand runs largely to flat-rolled steel products, carbon steel bars and cold-rolled steels.

The oil pipeline from Edmonton to Superior, Wis., for which the first pipe was delivered recently, means big business for Canadian steel mills, especially the Steel Co. of Canada Ltd. This company provides the raw materials for Page-Hersey Tubes, while the latter turns out the pipe. Furthermore, the Toronto rapid transit system, now in the preliminary stages of construction, also means big tonnage steel orders. There are also a number of other projects planned which will require steel in big tonnage lots. Steel men in this country do not expect any serious falling off in demand and production for two or three years although there may be a recession in demand for lighter steels toward the end of this year or early in 1951.

Westinghouse Opens New Plant

Pittsburgh—An entirely new insulating product will be produced by the new Westinghouse Electric Corp. plant near Irwin, Pa. The plant began operations recently with an initial force of 25 women employees. Eventually the plant, acquired by Westinghouse in March 1948 as part of a $132 million expansion and improvement program, will employ 250 to 300 persons.

Experimental Plant Set Up

Pittsburgh—Pittsburgh Coke & Chemical Co. has set up an experimental plant on Neville Island to briquet flue dust and iron ore fines for blast furnace use. It is hoped that the process will be cheaper than the sintering process now being used in the steel industry.



LOOKING FOR TROUBLE: Technician inspects buckets of a General Electric J-47 turbine wheel by fluorescent penetrant process, involving the use of specially - compounded oil and powder and ultraviolet light. Minute defects in nonmagnetic materials, otherwise invisible, become apparent by this inspection.

Tool and Die Outlook

Continued from Page 101

ment contracts for small metal products or parts are being awarded. Presumably as a result of a misunderstanding of specifications or errors in bidding, often such contracts are let for little more than the normal cost of the materials required.

Collections in general were reported good, but requiring more watchfulness. There have been a few cases recently where companies with supposedly ample resources have suddenly been found to be involved in financial difficulties.

Describes Tax Problems

Most tool and die shops are down to a 40-hr week, but in several of the smaller cities they are still working five 9-hr days. In Detroit, a 32-hr week has not been uncommon, Mr. Eaton reported.

In connection with the Washington meeting, NTDMA gave an informal dinner to provide an opportunity for members to become better acquainted with their Senators and Congressmen.

Centre W. Holmberg, NTDMA president, outlined some of the tax problems that are causing tool and die manufacturers difficulty, including low depreciation allowances. Other speakers included, H. B. McCoy, director, Office of Domestic Commerce, U. S. Dept. of Commerce, and Otis H. Ellis, special counsel, House Small Business Committee.

Gen. Stewart E. Reimel and Capt. E. R. Henning, of the Production Office, National Security Resources Board, discussed with NTDMA how the tool and die industry could best fit into the overall industrial mobilization plans. Local committees to assist in placing and expediting rush orders for special tooling promise to be an important feature of any future war production effort.

Resume Your Reading on Page 101

Named Sales Representative

Chicago—P. W. Voss and Associates, 918 South Michigan Ave., Chicago, successor to Lindsley and Voss, has been named sales representative for the Automatic Transportation Co., manufacturer of electric industrial trucks.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Slide Rule Stuff"

THE typical economic planner of the welfare state leans heavily upon the slide rule as the major tool of his craft. He would be as helpless without it as a woodsman without his axe or a sculptor without his chisel. From time to time in these columns we have poked fun at the professional artisans of a gilded future for their dependence on precise figures and charts and calculating machines.

This criticism has been due primarily not to any prejudice against the use of facts but rather to the determination of the planners to ignore human nature and those imprecise imponderables which at times affect the future more vitally than any stack of figures. It is because these intangibles very frequently cause the most careful calculations, resting exclusively on "facts," to go astray that reasoning based on statistical tables should be used with the utmost caution.

However, this does not mean that honest figures on national income, freight car loadings, steel operations, money rates, etc., should be disregarded in making decisions and formulating policies. It merely means that the alloy of common sense and the impalpable elements of politics and psychology must be taken into account.

All this bears on a problem to which the business community is giving increasing attention, namely, the future character of the American dollar. At present the paper bills in our wallets are vague promises to pay something which is not defined in a future which is not specified. If a five dollar bill with its legend that the U. S. "Will Pay To The Bearer On Demand Five Dollars" is taken into the Treasury for fulfillment of the stated promise it will merely get the bearer another bill with precisely the same legend.

This means that our monetary engine is all horsepower and no brakes. It means that there is no limit on the total amount of our money saving only the discretion of Bureaucrats who ask us to trust them because, on their own representation, they are "competent and responsible" men. It means that the will to economize in government expenditures is always weakened by the active reservation that a failure to economize can bring no visible penalties.

The argument that our currency is safe because we have $24.5 billion in gold, that this is equal to 14.5 pct of our aggregate deposits and currency, that such a ratio is equal to, or greater than, any corresponding ratio in the past, rests dangerously on slide rule reasoning. It ignores the fact that this gold is as inaccessible to the public as the gold still locked in the ore of the Mother Lode.

No one knows whether the public will prefer its paper and deposit dollars to gold if given a free choice. No one knows to what extent this gold might be redistributed throughout the world if holders of dollar claims were given an opportunity to swap them for gold at $35 an oz.

A further intangible operating on the probabilities is the effect of deficit financing on public confidence in the currency. This provides another great unknown, "near money," i. e., government bonds, which could conceivably triple the dollar claims against our basic gold stocks.

Somewhere a procedure must be developed which will restore the convertibility of the American dollar. This procedure must take account not only of ascertainable physical factors but of mass psychology and of that subtle ballast, faith in the integrity of the government.

American Steel & Wire Acts To Prevent Second Smog Tragedy

Pittsburgh—American Steel & Wire Co. is doing everything it can to prevent a recurrence of a smog disaster such as occurred at Donora, Pa., in October, 1948.

At the annual meeting of the Donora Chamber of Commerce, details of a program for obtaining advance warning of weather conditions conducive to smog formation were outlined by Harvey B. Jordan, company president.

The company has set up its own weather station in cooperation with the U. S. Weather Bureau, has a full-time meteorologist on duty in Donora and is arranging for direct teletype service with the Weather Bureau in Washington.

In addition, Mr. Jordan said, the company has engaged the services of Weather Advisers, Inc., weather forecasting agency, which will first alert, then issue a final warning when weather conditions are such that a heavy smog is likely to materialize.

"If a warning should come," Mr. Jordan said, "then all citizens, as well as manufacturing industries, railroads and river boats can take appropriate action to minimize the possibility of danger."

American Steel & Wire operates a zinc plant at Donora, where 20 persons died during and following the disastrous smog.

Additional Items Increase Production at Ford Forge Plant

Canton, Ohio—Ford is adding spindle supports and steering arms for the Mercury passenger car and transmission sliding gears for the Ford tractor to the parts being produced at its Canton forge plant. At a later date a fourth forging part, truck ring gears for service, will be produced.

At the present time, the Canton plant is turning out approximately 1 million pounds of forgings a day for Ford, Lincoln and Mercury passenger cars and Ford trucks and tractors. The new items will add approximately 100,000 lb to the daily production figure.

IRON ORE—A Global Outlook

Discoveries of huge reserves in North and South America cancel major worry of steel industry, reflect high credit on men who did the job.—By TOM C. CAMPBELL

New York—Nature sometimes has a fine way of helping mankind. How else can we account for the discovery of the Quebec-Labrador iron ore bodies and those in Venezuela which I have just seen?

Just at the time when American steel producers were worried about the future ore supplies of the country both these discoveries were in the making. The realization was brought home that in as far as ore was concerned, the United States would not always be a "have" nation. This time the threat was real.

Men Behind the Scenes

But as research and work went on with the concentration of domestic low grade ores the Quebec-Labrador find turned into a bonanza. Likewise, in Venezuela work was in progress which would turn into one of the biggest discoveries in iron and steel history.

Behind these explorations was the work of men who were charged with the job of finding new ore bodies. In the case of Quebec-Labrador, Dr. Joe Retty of the Labrador Mining & Exploration Co. Ltd., subsidiary of Hollinger-Hanna group, kept after the search for iron ore near the border of Quebec-Labrador. The final story of that discovery ended in the interest of five steel firms which now have an option on ore that eventually will come out of that territory for the United States.

Genius and Hard Work

Meanwhile down in South America, Mack C. Lake was working hard for the U. S. Steel Corp. on a special assignment to find ore reserves that would last for years. Reserves that would help conserve what remained of the Mesabi ore. He did it after one of the most comprehensive searches for ore that has ever been made. It was systematic and thorough.

Coincident with these discoveries, work has been going on with Taconites. To think that they are out of the picture would be incorrect. There is plenty of work to do and much money must be spent but a way will be found to use these low grade ores to full advantage. Also success will mean that this country will never be entirely dependent on foreign ore in case of war.

Not mentioned enough is the big part that the Adirondacks play in the ore picture. Republic Steel Corp. and Jones & Laughlin Steel Corp. are high on these ores. And why not? Republic has for years been able to do a fine job of concentrating and keeping costs to a point where these concentrates can compete on a unit basis with other ores the company uses.

The ores of Utah and California are also an important part of the whole picture and will loom larger as that part of the country steps up its steel consumption.

The ores of Alabama will, in five years, be enriched with those coming from Venezuela. This will be all to the good and will help keep rising steel costs down.

But it must be realized that taconite preparation costs money and so does bringing ores from foreign countries, where costs are never going to be stable. Nonetheless, steel firms that are bringing in ores —such as Bethlehem from Venezuela, Republic soon from Africa and later U. S. Steel from Venezuela—do have their costs problems which will be reflected in the cost of steel over the next decade.

All Serve One Purpose

Looking at the whole picture it is plain to see that the Quebec-Labrador and Venezuela discoveries, as well as the coming taconite output, serve one purpose—and one only. To stretch out the limited supply of Mesabi ore which would surely be drained and lost to the United States had not people like Ben Fairless and John Munson of U. S. Steel; Gene Grace of Bethlehem; George Humphrey of M. A. Hanna and Charley White and Don Gillies of Republic been extra conscious of the future.

All of these developments mean in plain language that the United States will now be able to keep a large supply of Mesabi ore in the ground in case of a third world war. They mean also that relations with South America and Africa will be beneficial to those countries and to the United States. They can and will mean that President Truman's Point Four can be put into action.

The Complete Picture

If there is one thing that steel people in the U. S. abhor, it is the idea that Quebec-Labrador competes with Venezuela. Or that Africa will compete with those two. Or that the taconites will take a back seat because of Quebec-Labrador and South America. It just isn't so.

It is a pattern that all fits together. It is a pattern which means that costs must be kept low. It means that those who are in the Canada enterprise hope that those who are in Venezuela will come out fine. It means that the steel industry is interested in a price structure that will be as low as possible, consistent with financial safety. And it means that steel people are interested in a strong country with no chance of being caught without the ore to make the steel that will be needed over the next 100 years.

Coming Next Week

New York—In the next issue Tom C. Campbell, editor, THE IRON AGE, writes an on the scene, human interest story about U. S. Steel's fabulous iron ore industry in Venezuela.

This is the first eye-witness account by an American reporter on the scene of the discovery.

It is the second story on Cerro Bolivar appearing in THE IRON AGE. The first appeared on Dec. 30, 1948, and was the first disclosure publicly that the discovery had been made.

Construction Steel Awards

Fabricated steel awards this week included the following:

3500 Tons, Chicago, two apartment buildings at 860 Lake Shore Drive, to American Bridge Co.
2500 Tons, Seattle, addition to University of Washington stadium, to Consolidated Western Steel Corp.
2000 Tons, Fairfield, Ala., office building for Tennessee Coal, Iron & Railroad Co., to Virginia Bridge Co., Birmingham.
1500 Tons, 12-story pent house apartment, Grand & Lewis Streets, New York City, to Grand Iron Works, Inc., New York City.
1250 Tons, Cook County, Ill., Eden S Parkway railroad grade separation, to American Bridge Co.
950 Tons, Schuylkill County, Pa., Pennsylvania Department of Highways, through J. R. Baisley, to Bethlehem Steel Co., Bethlehem.
700 Tons, Dallas, International Harvester Co., parts depot, to Mosher Steel Co., Houston.
500 Tons, Denver, J. C. Penney store, to Midwest Steel and Iron Works Co., Denver.
500 Tons, Philadelphia, Penn Mutual Life Insurance Co., to Irwin & Leighton, Philadelphia, general contractor.
436 Tons, Lancaster, N. H. and Guildhall Vt-404 foot two span truss bridge, U. S. Route 2, to W. H. Hinman, Inc., North Anson, Me., low bidder.
381 Tons, Gilroy, Calif., grade separation south of Sargent overhead, through Fredrickson & Watson, to Bethlehem Steel Co., San Francisco.
365 Tons, Atlanta, building for Swift and Co., to Converse Bridge and Steel Co., Chattanooga, Tenn.
350 Tons, Philadelphia, addition to Edgcomb Steel Co. warehouse, to Bethlehem Steel Co., Bethlehem.
346 Tons, Derby, Conn., six piers for viaduct and two rolled beam bridges, to Mariani Construction Co., New Haven, Conn.
295 Tons, Wilmington, N. C., building for Swift and Co., to Converse Bridge and Steel Co., Chattanooga, Tenn.
192 Tons, Burlington, Mass., bituminous concrete surfacing and two bridges, to Lane Construction Co., Meriden, Conn.
160 Tons, Appleton, Wis., building addition for Irving Zuehlke Co., to Worden-Allen Co., Milwaukee.
140 Tons, Broadacre, Ohio, Pennsylvania Railroad, to Morris Wheeler Co., Philadelphia.

Fabricated steel inquiries this week included the following:

2723 Tons, Montgomery County, Construction of 9 bridges, Upper Merion Township, Pa. State Highway & Bridge Authority, bids to Mar. 3.
1710 Tons, Longview, Wash., approach of Columbia River bridge, Director of Highways, Olympia, bids to Mar. 7.
400 Tons, Wilkes-Barre, Pa., store for F. W Woolworth Co., through Sordoni Construction Co., Wilkes-Barre, Pa., due Feb. 23.
207 Tons, Luzerne County, Pa., construction of a through truss bridge, Secretary of Highways, Harrisburg, Pa. Bids to Mar. 3.

Reinforcing bar inquiries this week included the following:

1352 Tons, King and Kittitas Cos., Wash., snowsheds on Primary State Highway 2, Airplane Curve and Lake Keechelus snowsheds, Director of Highways, Olympia, bids to Feb. 28.
699 Tons, Montgomery County, Pa., construction of 9 bridges, Upper Merion Township, Pa. State Highway & Bridge Authority. Bids to March 3.
370 Tons, Chicago, Goldblatt store bldg.
273 Tons, Longview, Wash., approach of Columbia River bridge, Director of Highways, Olympia, bids to Mar. 7.
183 Tons, York County, Pa., construction of divided highway including two reinforced concrete structures, Secretary of Highways, Harrisburg, Pa. Bids to Mar. 10.
180 Tons, Evanston, Ill., building for Cadillac Sales and Service Co.
175 Tons, Cleveland, Mercantile Building.
117 Tons, Douglas Co., Wash., four bridges on Primary State Highway 10, Bridgeport to Leahy, Director of Highways, Olympia, bids to Mar. 7.

Reinforcing bar awards this week included the following:

1775 Tons, Milwaukee, sewage treatment plant to U. S. Steel Supply Co., Chicago.
1400 Tons, geological and chemistry building, University of California at Los Angeles, to Trojan Steel Co., Los Angeles.
680 Tons, Council Bluffs, Iowa, water purification plant, to Ceco Steel Products Co., Chicago.
500 Tons, Lemont, Ill., Argonne Laboratory building, to U. S. Steel Supply Co., Chicago.
240 Tons, Skokie, Ill., Eden S Parkway bridge to Calumet Steel Co., Chicago Heights, Ill.
216 Tons, Derby, Conn., six piers for viaduct and two rolled beam bridges, Mariana Construction Co., New Haven, Conn., awarded contract.
175 Tons, Gilroy, Calif., grade separation south of Sargent overhead, through Fredrickson & Watson, to Richards Reinforcing Steel Co., Oakland.
141 Tons, Lynnfield and Wakefield, Mass., bituminous concrete two steel stringer bridges and two concrete box bridges through A. V. Taurasi Co., Inc., Somerville, Mass., to Groisserv and Shlager Iron Works, Somerville, Mass.
120 Tons, Duluth, Piedmont School, to Zalk-Joseph Co., Duluth.
115 Tons, Bensenville, Ill., P and P Railroad Diesel Service building to Joseph T. Ryerson and Son, Chicago.
105 Tons, Fairmont, Minn., Lincoln school to the Hustad Co., Minneapolis.

RFC Readies Foreclosure Action Against Lustron Corp.

Washington—Reconstruction Finance Corp. last week drew down the curtain on further government financing of the Lustron Corp. It had already loaned the firm $37.5 million.

Convinced that further aid to the steel prefab enterprise would not be justified, the agency authorized its legal staff to file a foreclosure petition with the federal court at Columbus, Ohio. The plant itself is already owned by the government—under lease to Lustron—and both equipment and patent rights are pledged to RFC as security.

Officials decline comment on probable future action but two courses are seen as possible. If the court grants the foreclosure petition, the way would be paved for sale or lease of the facilities.

In the event the property were offered for sale, it would be contingent upon RFC to bid-in the facilities if a fair and reasonable return were not offered.

On the basis of dollar return from the sale of surplus war plants, an acceptable price would have to be $8 million or better.

An alternative would be for the court to appoint a receiver under whom plant operation might be continued, perhaps for manufacture of another line of products.

Homebuilding Rate Tops Record

Washington — January homebuilding activity, as measured by new starts, was the highest in history with 80,000 new nonfarm starts, according to preliminary Bureau of Labor figures.

This was 60 pct more than January a year ago. It was also the seventh consecutive month to show an increase over the corresponding month a year previous.

Construction Figures Reported

New York—The estimated value of building construction undertaken in New York State during 1949 was more than $1.1 billion, according to Edward Corsi, industrial commissioner. Three quarters of this amount was dedicated to housing, which, when completed, will provide 100,000 new dwelling units.

In New York City construction started during the year was valued at $540 million, with $354 million going for 44,160 new family quarters. New construction in the urban places outside New York City was valued at $294 million, with more than half this sum devoted to 20,603 dwelling units. Construction was concentrated in Nassau, Suffolk and Westchester counties where permits were granted for more than 34,000 residential units.

Norwegian Group Tours Plants

Washington—A Norwegian machine shop team of 13 members, ranging from lathe operators to technical researchers, has begun a six-week tour of study and visits to industrial plants and shipyards.

Included in the itinerary are plants of General Motors, Republic Steel Corp., the Budd Co., Yale & Towne Mfg. Co., Henry Disston & Sons, Inc., Link-Belt Co., and the Todd Shipyards Corp.

Briefs and Bulletins

contempt charges —Government pincers began closing in on the United Mine Workers this week. Civil and criminal contempt charges were hurled at Mr. Lewis on Feb. 20. The UMW must reply satisfactorily by Friday, Feb. 24 or heavy penalties are likely to be imposed. In an earlier action, Federal Judge Richmond Keech extended the temporary no-strike order until March 3. Justice Keech explained that he needed more time to consider the government's request for an 80-day Taft-Hartley injunction. The miners refusal to obey this temporary order brought about the contempt citation.

barge shipping—U. S. Steel reports that shipments of finished and semifinished steel products on the Monongahela R. last year were 96.8 pct higher than in 1948. Total of shipments by the corporation on all waterways was up only 10 pct due to the fact that they discontinued barge shipments from Duluth to Waukegan. A large barge shipper (American Barge Lines) reports that January billings for steel articles out of Pittsburgh were 70 to 75 pct higher last month than in January 1949.

sharp cut-back — Inland Steel Co. has banked two more blast furnaces at its Indiana Harbor plant due to shortage of coal. With only three of its eight blast furnaces remaining in operation, Inland expects a drop in daily steel output of 3000 tons, and will curtail operations in several departments. If no coal is mined this week, Inland plans to bank a sixth furnace and close its cold mill.

tube demand—Orders for seamless tubes are booked through the first half; lapweld is being scheduled for April delivery; jobber requirements for buttweld are good for the first half. Anybody looking for tubular specialties, however, can get almost immediate delivery, which is no change from what the picture had been in this product.

soil pipe—The soil pipe market which had been very strong, contrary to normal expectations in this season, has suddenly come acropper. Very drastic price cutting is reported in several quarters.

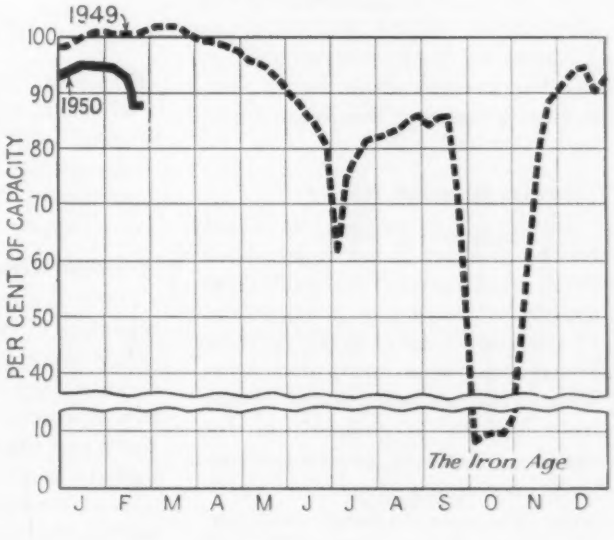
visiting—Bethlehem Steel Co. is beginning a round of plant visits by its officials and junior executives. The visits have been organized into five groups. The tours will take about 10 days each.

restrictions—The Tennessee Coal, Iron & Railroad Co., Birmingham, said this week it was faced with the necessity of ceasing operations at an undetermined number of finishing mills. From two to three openhearths have been taken off at Ensley, although normal steel output continues this week at Fairfield. All the company's ore mines, the dolomite quarry and No. 5 limestone mine have been placed on a three-day per week basis.

demand—The demand for plates is being held up by the continued strong demand for pipe. Manufacturers wire, which had been weak, is now strong. Merchant products are also reported stronger. Cold-rolled sheets remain very tight in all sectors. Galvanized sheets are almost impossible to obtain unless orders were placed months in advance.

strong demand—Ferroalloy business has been booming ever since the middle of December, with buyers calling for immediate delivery. Stainless steel producers in particular have been active buyers to meet the heavy demands of the current active stainless market. Even the ferrochrome market has picked up, despite low priced foreign offerings.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
February 12....	98.0*	98.5	76.0	79.0	92.0	101.5	89.0	82.0	94.5*	89.0	80.0	77.5	98.5	89.0
February 19....	86.0	96.5	71.5	76.0	95.5	101.5	89.5	80.0	95.0	83.7	76.0	88.9	98.6	89.5

* Revised.

Nonferrous METALS OUTLOOK

Market Activities



by John Anthony

Alcoa to produce magnesium sheet at New Kensington . . .

To double national magnesium sheet capacity . . . Riverside

Metal offers beryllium copper

New York—The Aluminum Co. of America will establish a division for rolling magnesium sheet at its New Kensington, Pa., plant. Dow Chemical Co. is at present the only producer of aircraft quality magnesium sheet, but its production facilities at Midland, Mich., are limited. White Metal Rolling & Stamping Co., Brooklyn, N. Y., is another present producer of magnesium sheet, but the range of alloys is limited.

Aircraft Demand Heavy

Demand for magnesium sheet by the aircraft industry has been very great during the past year, especially since the development of the Consolidated B-36. The industry has been prevented from taking further advantage of the light weight of magnesium for sheet applications due to the limited production facilities available. The new capacity will permit wider use of magnesium sheet by the industry to extend flight distances with a given fuel load and raise aircraft ceilings.

Magnesium rolling operations have been carried on at New Kensington in the past as the American Magnesium Division of Alcoa. But operations were discontinued in 1947 due to the sharp drop in sheet demand after the end of the war. This was also true of the Baltimore magnesium sheet facilities of Revere Copper and Brass, Inc.

Need Additional Producers

Dow Chemical Co. has been working for some time to get another sheet producer started so as to take care of the demand. Eastern Stainless Steel Co. in Baltimore had done considerable development work on the project when it was abandoned. Reynolds Metals Co. also gave it a whirl, but the facilities at McCook Field were considered insufficiently flexible to take the frequent gage, size and alloy changes.

It is understood that the Alcoa rolling facilities at New Kensington will approximately duplicate the Dow facilities at Midland, thereby doubling the nation's capacity for magnesium sheet. Midland produces sheets up to and including 48 in. wide, and in lengths up to 144 in. Alcoa reports that sufficient orders are now assured to make possible the establishment of the New Kensington production on a developmental basis. With high productivity developed through modern production techniques, Alcoa foresees that additional orders for magnesium sheet may permit an eventual increase in the capacity at New Kensington.

New Beryllium Producer

Riverside Metal Co., Riverside, N. J., has announced its return to the production of beryllium copper. The company offers wire sizes down to 0.020 in. diam and rods up to 2¼ in. diam. Sheet and strip is offered in widths up to 8 in. and gages down to 0.005 in.

NONFERROUS METALS PRICES

	Feb. 15	Feb. 16	Feb. 17	Feb. 18	Feb. 20	Feb. 21
Copper, electro, Conn.	18.50	18.50	18.50	18.50	18.50	18.50
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625	18.625
Tin, Straits, New York	74.50	74.50	74.50	74.50	74.50	74.50
Zinc, East St. Louis	9.75	9.75	9.75	9.75	9.75	9.75
Lead, St. Louis	11.80	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25 36.7¢ to $1.05; 35 to 37, 44¢ to $1.53; 47 to 49, 63.5¢ to $2.20.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4; ⅛ to 11/32 in., 49¢ to 38¢; ⅜ to 1½ in., 37.5¢ to 35.5¢; 1 9/16 to 3 in., 35.5¢ to 32.5¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T-6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher. Base: Up to ⅜ in. diam., 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Square, Hex. Bar: M, size across flats, in., ⅛ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher. Base: Up to ¾ in. diam, 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢ 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ⅞ to 2¼, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and bars	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	..	40

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	32.18	....	31.78
Copper, h-r	....	28.03	....
Copper, drawn	....	29.28	....
Low brass	30.12	29.81	33.03*
Yellow brass	28.69	28.38	31.70*
Red brass	30.60	30.29	33.51*
Naval brass	33.51	27.57	28.82
Leaded brass	....	23.19	27.22
Com'l bronze	31.61	31.30	34.27*
Manganese bronze	37.01	30.92	32.42
Phosphor bronze	50.90	51.15	....
Munts metal	31.58	27.14	28.39
Everdur, Herculoy, Olympic, etc.	37.19	36.14	....
Nickel silver, 10 pct	39.66	41.87	46.80
Arch. bronze	....	....	27.22

*Seamless tubing.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	27.25
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$52.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	18.50
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $110
Lead, St. Louis	11.80
Lead, New York	12.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, 100 to 5000 lb	36¢ to 38¢
Mercury, dollars per 76-lb flask f.o.b. New York	$70 to $73
Nickel, electro, f.o.b. New York	42.97
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$66 to $69
Silver, New York, cents per oz.	73.25
Tin, New York	74.50
Zinc, East St. Louis	9.75
Zinc, New York	10.47
Zirconium copper, 10-12 pct Zr, per lb contained Zr	$12.00

Remelted Metals

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	16.75-18.25
No. 120	16.25-17.75
No. 123	15.75-17.25
80-10-10 ingot	
No. 305	21.75
No. 315	19.75
88-10-2 ingot	
No. 210	27.75
No. 215	25.25
No. 245	18.25-21.00
Yellow ingot	
No. 405	14.25-16.00
Manganese bronze	
No. 421	20.75

Aluminum Ingot

(Cents per lb, lot of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.50-19.00
0.60 copper, max.	18.25-18.75
Piston alloys (No. 122 type)	16.50-17.00
No. 12 alum. (No. 2 grade)	16.25-16.75
108 alloy	16.75-17.25
195 alloy	17.50-18.00
13 alloy	18.50-19.00
AXS-679	16.75-17.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	17.75-18.50
Grade 2—92-95%	16.75-17.50
Grade 3—90-92%	15.75-16.50
Grade 4—85-90%	15.25-15.75

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	35½
Electrodeposited	29¾
Rolled, oval, straight, delivered	33
Ball anodes	33¾
Brass, 80-20	
Cast, oval, 15 in. or longer	31¼
Zinc, oval, 99.886, f.o.b. Detroit	17½
Ball anodes	16¼
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46½
Copper sulfate, 99.5 crystals, bbl	11.10
Nickel salts, single or double, 4-100 lb bags, frt allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz lots, per oz	59
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, 89 pct granular	11.00
Zinc cyanide, 100 lb drums	38.00

Scrap Metals

Brass Mill Scrap

(Cents per pound; add ⅛¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	15½	14¾
Yellow brass	12½	11⅝
Red brass	14	13¼
Commercial bronze	14¼	13½
Manganese bronze	12	11¼
Leaded brass rod ends	12¼	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	15.25
No. 2 copper wire	14.25
Light copper	13.25
Refinery brass	13.50*
Radiators	9.75

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	15.25
No. 2 copper wire	14.25
Light copper	13.25
No. 1 composition	12.25
No. 1 comp. turnings	11.75
Rolled brass	10.50
Brass pipe	11.00
Radiators	10.00
Heavy yellow brass	9.75
Aluminum	
Mixed old cast	10.00-10.50
Mixed old clips	9.75-10.00
Mixed turnings, dry	7.00- 7.50
Pots and pans	9.75-10.00
Low copper	11.50-12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	13¾—14
No. 2 heavy copper and wire	12¾—13
Light copper	11½—11¾
Auto radiators (unsweated)	8½— 8¾
No. 1 composition	11 —11¼
No. 1 composition turnings	10½—10¾
Clean red car boxes	9 — 9¼
Cocks and faucets	9 — 9¼
Mixed heavy yellow brass	7¼— 7½
Old rolled brass	8½— 8¾
Brass pipe	9¼— 9½
New soft brass clippings	10½—11
Brass rod ends	9¾—10
No. 1 brass rod turnings	9½— 9¾

Aluminum

Alum. pistons and struts	4½— 5
Aluminum crankcases	7 — 7½
2S aluminum clippings	10½—11
Old sheet and utensils	7 — 7½
Borings and turnings	4
Misc. cast aluminum	7 — 7½
Dural clips (24S)	7 — 7½

Zinc

New zinc clippings	6½— 7
Old zinc	4 — 4½
Zinc routings	2½— 3
Old die cast scrap	3¼— 3½

Nickel and Monel

Pure nickel clippings	21 —23
Clean nickel turnings	14 —15
Nickel anodes	20 —22
Nickel rod ends	20 —22
New Monel clippings	12 —14
Clean Monel turnings	8 — 9
Old sheet Monel	10 —12
Old Monel castings	9 —10
Inconel clippings	11 —13
Nickel silver clippings, mixed	8 —10
Nickel silver turnings, mixed	6 — 7

Lead

Soft scrap, lead	9½— 9¾
Battery plates (dry)	4¼— 4½

Magnesium

Segregated solids	9 —10
Castings	5½— 6½

Miscellaneous

Block tin	60 —62
No. 1 pewter	38 —40
No. 1 auto babbitt	35 —37
Mixed common babbitt	9 — 9¼
Solder joints	11½—12
Siphon tops	40 —42
Small foundry type	11½—12
Monotype	10½—11
Lino. and stereotype	9¾—10¼
Electrotype	8¼— 8½
New type shell cuttings	11½—11¾
Hand picked type shells	4 — 4½
Lino. and stereo. dross	4¾— 5
Electro. dross	2¾— 3

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Feb. 21, 1950	Feb. 14, 1950	Jan. 24, 1950	Feb. 22, 1949
Hot-rolled sheets	3.35	3.35	3.35	3.26
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.265
Cold-rolled strip	4.21	4.21	4.21	4.063
Plates	3.50	3.50	3.50	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.50	6.50	6.50	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.37
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.194
Rails: (dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.619
Skelp	3.15	3.15	3.15	3.25

Prices advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Feb. 21, 1950	Feb. 14, 1950	Jan. 24, 1950	Feb. 22, 1949
No. 2, foundry, Phila.	$50.42	$50.42	$50.42	$51.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	47.08	49.46
No. 2, Birmingham	42.38	42.38	40.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	50.76
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese‡	173.40	173.40	173.40	161.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross tons)				
Heavy melt'g steel, P'gh.	$31.75	$31.25	$29.75	$38.75
Heavy melt'g steel, Phila.	23.00	23.00	23.00	38.50
Heavy melt'g steel, Ch'go	27.50	27.50	27.50	34.50
No. 1 hy. com. sh't, Det.	22.50	22.50*	23.50	33.00
Low phos. Young'n	32.75	31.75	30.75	45.25
No. 1, cast, Pittsburgh	37.50	37.50	37.50	51.50
No. 1, cast, Philadelphia	35.50	35.50	37.00	44.00
No. 1, cast, Chicago	39.50	38.50	38.50	42.00

* Corrected.

Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.00	$14.00	$14.00	$15.25
Foundry coke, prompt	15.75	15.75	15.75	16.75

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	18.50	18.50	18.50	23.50
Copper, Lake Conn.	18.625	18.625	18.625	23.625
Tin Straits, New York	74.50	74.50	75.50	$1.03
Zinc, East St. Louis	9.75	9.75	9.75	17.50
Lead, St. Louis	11.80	11.80	11.80	21.30
Aluminum, virgin	17.00	17.00	17.00	17.00
Nickel electrolytic	42.97	42.97	42.97	42.93
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	27.25	27.25	28.75	38.50

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
Feb. 21, 1950	3.837¢ per lb.	$46.38 per gross ton	$27.42 per gross ton
One week ago	3.837¢ per lb.	46.38 per gross ton	27.25 per gross ton
One month ago	3.837¢ per lb.	46.05 per gross ton	26.75 per gross ton
One year ago	3.754¢ per lb.	46.74 per gross ton	37.25 per gross ton

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3	$46.38 Feb. 7	$45.88 Jan. 3	$27.25 Feb. 7	$26.25 Jan. 3
1949	3.837¢ Dec. 27	3.705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

MARKETS—PRICES—TRENDS



SCRAP
Iron & Steel

No. 1 Steel Moves Up in Some Districts

The tone of the market was better in several districts during the past week. Some spots are dominated by uncertainty over coal. Others show the effects of larger scrap charges to overcome the growing coke shortage.

No. 1 heavy melting steel was $1.00 a ton higher at Birmingham and in the Valley and rose 50¢ in Pittsburgh. Emphasis on quality still shows up in general weakness or lack of movement in No. 2 steel and some dealers bundles. Railroad heavy melting was stronger at Pittsburgh and Birmingham.

Surprising to many who recall the wild gyrations of the postwar scrap market is the way prices have behaved despite the increasing use of scrap to counter the coal shortage. Despite some healthy slashes in blast furnace operations the steelmaking rate had fallen very little by the beginning of this week. The difference was made up by larger scrap charges in openhearths and in those blast furnaces that remained in production.

PITTSBURGH — A sale to a large Pitttsburgh consumer moved the price of No. 1 heavy melting steel to a $32 top, up 50¢ from last week. No. 2 went for $29 on the same order. Machine shop turnings were up $1 as crushers increased their buying prices. Short turnings were $1 on a sale. Low Phos was up $1 to top of $33.50. The railroad list also went for slightly higher prices. The Pittsburgh quotation on No. 2 heavy melting steel on p. 132 of the Feb. 16 issue was an error. It should have been as the market summary indicated, $28.50 to $29.

CHICAGO—The scrap market has relapsed into an inactive period of waiting to see what the coal miners will do. No evidence of price weakness has developed as yet. Though mills are not placing new orders and in some cases are holding up shipment on existing orders. Bundles continue to be a troublesome item for many dealers, who have bundles they would be willing to sell at lower than the going prices, if the mills would take them. Dealers from whom the mills will buy bundles command good prices, though shipments at the premium prices quoted last week declined to a point where tonnages moving at such prices are not sufficient to represent true market conditions.

PHILADELPHIA — There was very little change in the market here last week. What little business was placed in steel grades went at the previously quoted prices. The foundry strike in Philadelphia, coupled with the slump in the soil pipe market, has weakened the cast market. The spread has narrowed on machine shop turnings and low phos grades.

NEW YORK — Business marked time here early this week because of uncertainty on mill operations. It looks very much as though No. 2 heavy melting would not hold long at its present level. It may be off $1 to $1.50 a ton before the week is out, but cleanup of old orders is holding it for the present. While few brokers have any orders to justify raising mixed yard cast, there was some business being done at as much as $25.50, up 50¢ over last week.

DETROIT—With the continued uncertainty about the coal strike, scrap prices are hanging at present at earlier levels. There were scattered indications this week the market is somewhat firmer here, but in the absence of mill buying this has not yet been translated into higher prices. The trend of the market here appears to be definitely hinged to the coal strike for the next few weeks.

CLEVELAND—No. 1 steel and No. 1 bundles are quotable at a top of $32 in the valley this week, based on purchase of a representative tonnage by a valley consumer. Also, a stronger market for cast and blast is developing. On the other hand, one major consumer in this district is reducing shippers' schedules. The scrap market here and in the valley is acting like it did during the steel strike, going by opposites, with prices firming up in the face of reduced operations.

ST. LOUIS—The strength in scrap iron as evidenced in Pittsburgh has not been reflected in the St. Louis industrial district and prices are unchanged. Mills are out of the market for the present. Mills are insisting on a better grade of scrap than formerly, declaring that shipments are not properly separated and too often contain nonferrous metals.

BOSTON—There was a little activity in steelmaking grades this week—nothing to write home about, but enough to firm prices a bit. The top price on No. 1 steel was up 50¢ and on No. 2 $1 a ton. The whole steelmaking list reflected this same strength while cast grades dragged their heels. The top price on No. 1 cast was off 50¢. Stove plate was $1 weaker though there was a little activity in that grade.

BUFFALO—Inertia gripped the scrap market during the week as uncertainty over the coal strike held buying interests at a low ebb. Dealers continue to ship against old orders placed within current ranges.

CINCINNATI—Prices are unchanged in a slow scrap market here. Some consumers are taking cast grades for the openhearths and blast furnace grades are firm at quoted prices, but otherwise consumers are moving very cautiously.

BIRMINGHAM—The market here for better grades of openhearth and blast furnace material has strengthened pricewise. No. 1 heavy melting steel is being quoted at a price advance of $1.

Scrap IRON & STEEL Prices

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$31.50 to $32.00
No. 2 hvy. melting	28.50 to 29.00*
No. 1 bundles	31.50 to 32.00
No. 2 bundles	23.50 to 24.00
Machine shop turn.	22.00 to 22.50
Mixed bor. and ms. turns.	22.00 to 22.50
Shoveling turnings	25.50 to 26.00
Cast iron borings	25.50 to 26.00
Low. phos. plate	33.00 to 33.50
Heavy turnings	27.00 to 28.00
No. 1 RR. hvy. melting	33.00 to 33.50
Scrap rails, random lgth.	35.50 to 36.50
Rails 2 ft and under	39.00 to 40.00
RR. steel wheels	35.50 to 36.00
RR. spring steel	35.50 to 36.00
RR. couplers and knuckles	35.50 to 36.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	31.00 to 32.00
Malleable	33.00 to 34.00

*See market summary p. 117

Chicago

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 factory bundles	27.00 to 28.00
No. 1 dealers' bundles	24.00 to 27.00
No. 2 dealers' bundles	21.00 to 23.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	20.00 to 21.00
Low phos. forge crops	32.00 to 33.00
Low phos. plate	30.00 to 31.00
No. 1 RR. hvy. melting	29.00 to 30.00
Scrap rails, random lgth.	33.00 to 34.00
Rerolling rails	40.00 to 41.00
Rails 2 ft and under	39.00 to 40.00
Locomotive tires, cut	34.00 to 35.00
Cut bolsters & side frames	31.00 to 32.00
Angles and splice bars	35.00 to 36.00
RR. steel car axles	42.00 to 43.00
RR. couples and knuckles	32.00 to 33.00
No. 1 machinery cast.	39.00 to 40.00
No. 1 agricul. cast.	37.00 to 38.00
Heavy breakable cast.	30.00 to 31.00
RR. grate bars	29.00 to 30.00
Cast iron brake shoes	30.00 to 31.00
Cast iron car wheels	36.00 to 37.00
Malleable	36.00 to 37.00

Philadelphia

No. 1 hvy. melting	$22.50 to $23.50
No. 2 hvy. melting	20.50 to 21.50
No. 1 bundles	22.50 to 23.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	15.50 to 16.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 17.50
Low phos. punchings, plate	25.50 to 26.00
Low phos. 5 ft and under	24.50 to 25.00
Low phos, bundles	24.50 to 25.00
Hvy. axle forge turn.	22.50 to 23.50
Clean cast chem. borings	28.00 to 29.00
RR. steel wheels	28.00 to 29.00
RR. spring steel	28.00 to 29.00
Rails 18 in. and under	36.00 to 37.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	29.00 to 30.00
Heavy breakable cast.	30.50 to 31.50
Cast iron carwheels	35.00 to 36.00
Malleable	34.00 to 35.00

Cleveland

No. 1 hvy. melting	$28.00 to $28.50
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	28.00 to 28.50
No. 1 bundles	28.00 to 28.50
No. 2 bundles	22.50 to 23.00
Machine shop turn.	18.50 to 19.00
Mixed bor. and turn.	20.50 to 21.00
Shoveling turnings	20.50 to 21.00
Cast iron borings	20.50 to 21.00
Low phos. 2 ft and under	29.00 to 29.50
Steel axle turn.	27.00 to 27.50
Drop forge flashings	28.00 to 28.50
No. 1 RR. hvy. melting	32.00 to 32.50
Rails 3 ft and under	42.00 to 43.00
Rails 18 in. and under	43.00 to 44.00
No. 1 machinery cast.	42.00 to 43.00
RR. cast.	42.00 to 43.00
RR. grate bars	30.00 to 31.00
Stove plate	34.00 to 35.00
Malleable	38.00 to 39.00

Youngstown

No. 1 hvy. melting	$31.50 to $32.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	31.50 to 32.00
No. 2 bundles	$24.50 to $25.00
Machine shop turn.	21.00 to 21.50
Shoveling turnings	23.00 to 23.50
Cast iron borings	23.00 to 23.50
Low phos. plate	32.50 to 33.00

Buffalo

No. 1 hvy. melting	$27.50 to $28.00
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	25.50 to 26.00
No. 1 bundles	26.50 to 27.00
No. 2 bundles	24.00 to 24.50
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	19.00 to 19.50
Shoveling turnings	20.50 to 21.00
Cast iron borings	19.50 to 20.00
Low phos. plate	29.00 to 29.50
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	38.50 to 39.00
RR. steel wheels	33.00 to 33.50
RR. spring steel	33.00 to 33.50
RR. couplers and knuckles	33.00 to 33.50
No. 1 machinery cast.	35.00 to 36.00
No. 1 cupola cast.	31.00 to 32.00
Stove plate	32.50 to 33.00
Small indus. malleable	30.00 to 30.50

Birmingham

No. 1 hvy. melting	$24.00
No. 2 hvy. melting	22.00
No. 2 bundles	20.00
No. 1 busheling	23.00
Machine shop turn.	$16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00
Bar crops and plate	27.00 to 28.00
Structural and plate	27.00 to 28.00
No. 1 RR. hvy. melt.	26.00 to 27.00
Scrap rails, random lgth.	29.00 to 30.00
Rerolling rails	33.00 to 34.50
Rails 2 ft and under	35.50 to 36.00
Angles & splice bars	34.00 to 35.00
Std. steel axles	28.00 to 29.00
No. 1 cupola cast.	34.00 to 35.00
Stove plate	29.00 to 30.00
Cast iron carwheels	28.00 to 29.00

St. Louis

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 bundled sheets	24.00 to 25.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	18.00 to 19.00
Rails, random lengths	30.00 to 31.00
Rails 3 ft and under	35.00 to 36.00
Locomotive tires, uncut	27.00 to 28.00
Angles and splice bars	34.00 to 35.00
Std. steel car axles	39.00 to 41.00
RR. spring steel	30.00 to 31.00
No. 1 machinery cast.	36.00 to 37.00
Hvy. breakable cast.	29.00 to 30.00
Cast iron brake shoes	27.00 to 28.00
Stove plate	27.00 to 28.00
Cast iron car wheels	34.00 to 35.00
Malleable	31.00 to 33.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$20.25 to $20.75
No. 2 hvy. melting	17.50 to 18.00
No. 2 bundles	15.50 to 16.00
Machine shop turn.	10.50 to 11.00
Mixed bor. and turn.	10.50 to 11.00
Shoveling turnings	11.00 to 11.50
Clean cast chem. bor.	23.00 to 24.00
No. 1 machinery cast.	26.50 to 27.00
Mixed yard cast.	25.00 to 25.50
Charging box cast.	24.50 to 25.00
Heavy breakable cast.	24.50 to 25.00
Unstrp. motor blocks	19.00 to 20.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$19.50 to $20.00
No. 2 hvy. melting	16.50 to 17.00
No. 1 bundles	19.50 to 20.00
No. 2 bundles	$15.00 to $15.50
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	12.50 to 13.00
No. 1 busheling	17.00 to 17.50
Clean cast chem. borings	18.00 to 18.50
No. 1 machinery cast.	25.50 to 26.50
No. 2 machinery cast.	21.00 to 22.00
Heavy breakable cast.	22.00 to 23.00
Stove plate	20.00 to 21.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$21.00 to $22.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 bundles	22.00 to 23.00
New busheling	21.00 to 22.00
Flashings	21.00 to 22.00
Machine shop turn.	14.00 to 14.50
Mixed bor. and turn.	14.00 to 14.50
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Low phos. plate	22.00 to 23.00
No. 1 cupola cast.	31.00 to 32.00
Heavy breakable cast.	25.00 to 26.00
Stove plate	26.00 to 27.00
Automotive cast.	34.00 to 35.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$25.50 to $26.00
No. 2 hvy. melting	21.50 to 22.00
No. 1 bundles	25.50 to 26.00
No. 2 bundles	17.50 to 18.00
Machine shop turn.	12.50 to 13.00
Mixed bor. and turn.	13.50 to 14.00
Shoveling turnings	15.50 to 16.00
Cast iron borings	15.50 to 16.00
Low phos. 18 in. under	32.00 to 32.50
Rails, random lengths	32.00 to 33.00
Rails, 18 in. and under	42.00 to 43.00
No. 1 cupola cast	35.00 to 36.00
Hvy. breakable cast	31.00 to 32.00
Drop broken cast	41.00 to 42.00

San Francisco

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	20.00
Scrap rails, random lgth.	20.00
No. 1 cupola cast.	$30.00 to 35.00

Los Angeles

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Mach. shop turn.	9.00
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	$32.50 to 35.00

Seattle

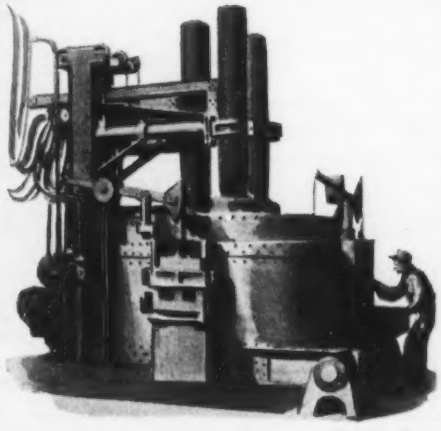
No. 1 hvy. melting	$18.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Elec. fur. 1 ft and under	$25.00 to 28.00
RR. hvy. melting	19.00
No. 1 cupola cast.	30.00
Heavy breakable cast.	20.00

Hamilton, Ont.

No. 1 hvy. melting	$24.00
No. 1 bundles	16.00
No. 2 bundles	16.00
Mechanical bundles	22.00
Mixed steel scrap	20.00
Mixed bor. and turn.	18.00
Rails, remelting	24.00
Rails, rerolling	27.00
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BUFFALO, N.Y. Genesee Bldg.	DETROIT, MICH. 2011 Book Bldg.	NEW YORK, N.Y. Woolworth Bldg.	READING, PA. Luria Bldg.
ST. LOUIS, MO. 2110 Railway Exchange Bldg.		SAN FRANCISCO, CAL. Pacific Gas & Elec. Co., Bldg.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00 1													$50.00 31
Alloy, net ton	$51.00 1.17													$51.00 31
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00 1	$53.00 1	$53.00 1				$57.00 13		$53.00 3	$58.00 26	$53.00 3			
Carbon forging billets, net ton	$63.00 1	$63.00 1.4	$63.00 1.8	$63.00 4			$63.00 25		$63.00 3.4	$65.00 26	$63.00 3			$63.00 31
Alloy, net ton	$66.00 1.17	$66.00 1.4	$66.00 1		$66.00 4.42		$66.00 13	$66.00 3	$66.00 3.4	$68.00 26	$66.00 3			$66.00 31
SHEET BARS							$57.00 13							
PIPE SKELP	3.15 1						3.15 1.4							
WIRE RODS	3.85 2.18	3.85 2.4.33	3.85 6	3.85 2			3.85 6				3.85 3	3.95 3		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35 1.5.9.15	3.35 23	3.35 1.6.8	3.35 4.5			3.35 1.4.6.13		3.35 3	3.45 26		3.35 3		3.55 12
Cold-rolled	4.10 1.5 7.9.15.63		4.10 1.6.8	4.10 4.15		4.10 7	4.10 4.6		4.10 3			4.10 3	4.30 22	4.30 12
Galvanized (10 gage)	4.40 1.9.15		4.40 1.8		4.40 4		4.65 6 4.75 4 4					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40 6 4.90 7 6						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9.15		4.80 1			4.80 7	4.80 64							
Hi Str. low alloy, h.r.	5.05 1.5.9	5.05 1	5.05 1.6.8	5.05 4.5			5.05 1.4.6.13		5.05 3	5.05 26		5.05 3		5.25 12
Hi Str. low alloy, c.r.	6.20 1.5.9		6.20 1.6.8	6.20 4.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
Hi Str. low alloy, galv.	6.75 1											6.75 3		
STRIP Hot-rolled (over 6 in.)	3.25 5.7.9.28	3.25 3.66	3.25 1.6.8	3.25 5			3.25 1.4.6.13		3.25 3	3.35 26		3.25 3		3.45 12.47
Cold-rolled	4.15 5.7.9.63	4.30 8.66	4.30 8	4.15 2.5		4.15 7	4.15 4.6.13.40.48.49		4.15 3			4.15 3		4.40 68 81 4.35 12 47
Hi Str. low alloy, h.r.	4.95 9		4.95 1.6.8	4.95 5			4.95 1.4.6.13		4.95 3	4.95 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.20 9			6.20 2.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50 1.5.9.15		$7.50 1.6.8				$7.50 4					$7.60 3	$7.70 22	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30 1.5.15		5.30 1.6				5.30 4					5.40 3	5.50 22	
BARS Carbon steel	3.45 1.5.9.17	3.45 1.4.23	3.45 1.6.8	3.45 4	3.45 4		3.45 1.4.6		3.45 3.4		3.45 3			3.65 12
Reinforcing‡	3.45 1.5	3.45 4	3.45 1.6.8	3.45 4			3.45 1.4.6		3.45 3.4		3.45 3	3.45 3		
Cold-finished	4.10 5 4.15 2 4 17.52.69.71	4.15 2 23.69.70	4.15 4.73.74	4.15 2.61	4.15 4.32.82		4.15 6.40.57		4.15 70					4.45 12 4.30 8 4
Alloy, hot-rolled	3.95 1.17	3.95 1.4.23	3.95 1.6.8		3.95 4		3.95 1.6.25	3.95 3	3.95 3.4		3.95 3			4.25 12
Alloy, cold-drawn	4.90 2.17.52.69.71	4.90 2.23.69.70	4.90 4.73.74	4.90 2.61	4.90 4.42.82		4.90 6.25.57	4.90 3	4.90 3.70					5.09 4
Hi Str. low alloy, h.r.	5.20 1.5		5.20 1.6.8	5.20 4			5.20 1.6	5.20 3	5.20 3		5.20 3			5.40 12
PLATE Carbon Steel	3.50 1.5	3.50 1	3.50 1.6.8	3.50 4			3.50 1.13		3.50 3	3.60 26	3.50 3	3.50 3		3.75 12
Floor plates	4.55 1	4.55 1	4.55 3	4.55 5						4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 13			4.40 26	4.40 3	4.40 3		
Hi Str. low alloy	5.35 1.5	5.35 1	5.35 1.3	5.35 4.5			5.35 6			5.35 26	5.35 3	5.35 3		5.60 12
SHAPES, Structural	3.40 1.5.9	3.40 1.23	3.40 1.6.8					3.45 3	3.45 3		3.45 3			
Hi Str. low alloy	5.15 1.5	5.15 1	5.15 1.6.8				5.15 6	5.15 3	5.15 3		5.15 3			
MANUFACTURERS' WIRE Bright	4.50 2.5.18	4.50 2 4.12.33.34		4.50 2.77			4.50 6	Kokomo = 4.60 30			4.50 3	4.60 3	Duluth = 4.50 2 Pueblo = 4.75 14	
PILING, Steel sheet	4.20 1.9	4.20 1							4.20 3					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
					INGOTS Carbon forging, net ton
	$59.00 83				Alloy, net ton
		$53.00 11	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00 83	$63.00 11	F=$82.00[19]	Geneva=$61.00[16]	Carbon forging billets, net ton
	$74.00 83		F=$85.00[19]		Alloy, net ton
				Portsmouth=$55.00[20]	SHEET BARS
					PIPE SKELP
	4.25 83	3.85 11	SF=4.50[24], LA=4.65[21] LA=4.20[62]	Portsmouth=3.85[20] Worcester=4.15[2]	WIRE RODS
		3.35 4.11	SF, LA=4.05[24] F=4.25[19]	Ashland[7]=3.35 Niles=3.50[64]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10 11	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40 4.11	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05 11	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85 83	3.65 83	3.25 11	SF, LA=4.00[24,62] F=4.40[19] S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	STRIP Hot-rolled
			F=5.40[19] LA=5.50[27]	New Haven=4.65[2,68]	Cold-rolled
		4.95 11	F=6.64[19]		Hi Str. low alloy, h.r.
			F=6.95[19]		Hi Str. low alloy, c.r.
		7.60 11	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05 83	3.85 83	3.45 4.11	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.60[65]	BARS Carbon steel
4.05 83	3.85 83	3.45 4.11	SF, S=4.20[62] F=4.10[19]	Atlanta=3.60[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55 83	4.35 83		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[2]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90 83	3.50 4.11	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.60[29] Coatesville=3.60[21] Harrisburg=3.50[35]	PLATE Carbon steel
				Harrisburg=4.55[35]	Floor plates
			F=5.40[19]	Coatesville=4.50[21]	Alloy
		5.35 11	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00 83	3.80 82	3.40 11	SF=3.95[62] LA=4.00[24,62]	Phoenixville=3.30[56] Geneva=3.40[16]	SHAPES, Structural
		5.15 11	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi Str. low alloy
5.10 83	4.90 82	4.50 4.11	SF, LA=5.45[24] LA=5.10[62]	Portsmouth=4.50[20] Worcester=4.80[2]	MANUFACTURERS' WIRE Bright

Notes: †Special coated mfg ternes, deduct $1.00 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Co., Inc., Oakland, Calif.
20 Portsmouth Steel Corp., Portsmouth, Ohio
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersall Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Indianapolis
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forgings Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	Pittsburg, Calif.
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	116	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. ††Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	Pittsburg, Calif.
Merch. wire, annealed‡	$5.35	$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance, 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Allquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon		
10 pct, Coatesville (26)	27.50	
Inconel-carbon		
10 pct, Coatesville (21)	36.00	
Monel-carbon		
10 pct, Coatesville (21)	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	†6.45
Electrical	†*6.95
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*, add 20¢; Indiana Harbor, Ind., 8†, deduct 25¢; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7†, deduct 25¢.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. shorter	26	37
All diam., longer than 6 in.	22	34
Lag, all diam over 6 in. & longer	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	25 37
9/16 and ⅝ in.	23 35
¾ to 1½ in. inclusive	23 35
1⅝ in. and larger	16 29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 & ⅝ in.	36	30	36
¾ to 1½ in.	31	27	33
1⅝ in. and larger	21	17	...

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63½ and 10
Packaged, plated finish	50 and 10
Bulk, plain finish**	72*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.
**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger)
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa. $7.25

Small Rivets

(7/16 in. and smaller)
Pct Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 43

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter (SAE 1035) heat treated	54
Milled studs	28
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Tie plates, Pittsburgh, Torr., Calif.*	4.35
Track bolts, untreated	8.85
Track bolts, heat treated, to railroads	9.10

* Seattle, add 30¢.
† Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$13.50 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$15.50 to $16.00
Foundry, oven coke	
Buffalo, del'd	$20.90
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	23.50
St. Louis, del'd	21.60
Birmingham, del'd	19.75

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net: Effective CaF, content:

70% or more	$37.00
60% or less	34.00

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.60	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

REFRACTORIES *(F.o.b. works)*

Fire Clay Brick *Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $86.00
No. 1 Ohio 80.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 80.00
No. 2 Ohio 72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $86.00
Childs, Pa. 90.00
Hays, Pa. 91.00
Chicago District 95.00
Western, Utah and Calif. 101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago 106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 15.00
Silica cement, net ton, bulk, Hays, Pa. 17.00
Silica cement, net ton, bulk, Ensley, Ala. 16.00
Silica cement, net ton, bulk, Chicago District 16.00
Silica cement, net ton, bulk, Utah and Calif. 22.50

Chrome Brick *Per Net Ton*

Standard chemically bonded, balt., Chester $69.00

Magnesite Brick

Standard, Baltimore $91.00
Chemically bonded, Baltimore 80.00

Grain Magnesite *St. ⅜-in. grains*

Domestic, f.o.b. Baltimore, in bulk, fines removed ... $56.00 to $56.50
Domestic, f.o.b Chewelah, Wash., in bulk with fines ..... 30.50 to 31.00
in sacks with fines ..... 35.00 to 35.50

Dead Burned Dolomite

F.o.b producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ ... $12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags ... 7.4¢ to 9.0¢
Domestic sponge iron, 98+% Fe, carload lots ..... 9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe ..... 48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+%Fe .. 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micros, 98%, 99.8+% Fe 90.0¢ to $1.75
Aluminum ..... 29.00¢
Antimony ..... 42.53¢
Brass, 10 ton lots ..... 23.25¢ to 26.75¢
Copper, electrolytic ..... 28.625¢
Copper, reduced ..... 28.50¢
Cadmium $2.40
Chromium, electrolytic, 99% min. $3.50
Lead ..... 18.50¢
Manganese ..... 55.00¢
Molybdenum, 99% $2.65
Nickel, unannealed ..... 61.00¢
Nickel, spherical, minus 30 mesh, unannealed ..... 68.00¢
Silicon ..... 34.00¢
Solder powder ..... 8.5¢ plus metal cost
Stainless steel, 302 ..... 75.00
Tin ..... 86.50¢
Tungsten, 99% $2.90
Zinc, 10 ton lots ..... 15.50¢ to 18.25¢

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
	GRAPHITE	
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
	CARBON	
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

PIPE AND TUBING

Base discounts, f.o.b mills
Base price, about $200.00 per net ton

Standard, T & C

Steel, Buttweld*	*Black*	*Galv*
½-in.	40½ to 38½	24 to 22
¾-in.	43½ to 41½	28 to 26
1-in.	46 to 44	31 to 29
1¼-in	46½ to 44½	31½ to 29½
1½-in.	47 to 45	32 to 30
2-in.	47½ to 45½	32½ to 30½
2½ to 3-in.	48 to 46	33 to 31
Steel, lapweld		
2-in	37	23½ to 22½
2½ to 3-in.	41 to 40	25½ to 24½
3½ to 6-in.	44 to 40	28½ to 24½
Steel, seamless		
2-in.	36	20½
2½ to 3-in.	39	23½
3½ to 6-in.	41	25½

Wrought Iron, buttweld		
½-in.	+26½	+53
¾-in.	+16½	+42
1 & 1¼-in.	+10½	+33
1½-in.	+ 4½	+29½
2-in.	+ 4	+29
Wrought Iron, lapweld		
2-in.	+13½	+37
2½ to 3½-in.	+11	+32½
4-in.	+ 6	+26½
4½ to 8-in.	+ 8	+28
9 to 12-in.	+18	+37½

Extra Strong, Plain Ends

Steel, buttweld		
½-in.	39½ to 37½	24½ to 22½
¾-in.	43½ to 41½	28½ to 26½
1-in.	45½ to 43½	31½ to 29½
1¼-in.	46 to 44	32 to 30
1½-in.	46½ to 44½	32½ to 30½
2-in.	47 to 45	33 to 32
2½ to 3-in.	47½ to 45½	33½ to 31½
Steel, lapweld		
2-in.	37 to 36	22½ to 21½
3½ to 3-in.	42 to 40	27½ to 25½
3½ to 6-in.	45½ to 41½	41 to 29
Steel, seamless		
2-in.	35	20½
2½ to 3-in.	39	24½
3½ to 6-in.	42½	28

Wrought Iron, buttweld		
½-in.	+22	+47
¾-in.	+15½	+40
1 to 2-in.	+ 5½	+29
Wrought Iron, lapweld		
2-in.	+10½	+33½
2½ to 4-in.	+ 1	+22
4½ to 6-in.	+ 5	+26½
7 & 8-in.	list	+21½
9 to 12-in.	+11½	+29½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in in.	gage BWG	Seamless H.R.	Seamless C.R.	Electric Weld H.R.	Electric Weld C.D.
2	13	$20.61	$24.24	$19.99	$23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Cicago ... $91.80 to $95.30
6 to 24-in., del'd N. Y. ..... 91.00 to 92.00
6 to 24-in., Birmingham ... 78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... $108.50 to $113.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb. (Metropolitan area delivery, add 20c to base price except Birmingham, Cincinnati, Los Angeles, New Orleans and Philadelphia (*), add 15c).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.05	6.24–6.44[1]	6.46–6.46[2]	5.59–5.59[11]	....	5.20–5.64[11]	5.49	5.49–5.49[11]	6.19	....	10.05	....	....
Birmingham*	5.05[10]	5.80	6.16[7]	5.10[10]	....	5.20	5.05	5.00[10]	6.73	....	....	....	....
Boston	5.73	6.48[20]–6.85	6.79–7.24[21]	5.78	6.90–6.95	5.88	5.55	5.60	6.02–6.58	9.70–9.97	8.50–10.37	11.15	11.43
Buffalo	5.05	5.80	6.80	5.41	7.27	5.45	5.15	5.05	5.75	9.80	9.90	11.05	11.35
Chicago	5.05	5.80	6.70	5.10	5.45–6.16	5.20	5.05	5.00	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.32–5.97	5.80–6.24	6.29–6.39	5.49	....	5.59–5.74	5.44–5.59	5.39–5.54	6.10–6.25	9.60–9.81	9.90–10.11	11.05–11.26	11.35–11.56
Cleveland	5.05	5.80	6.95	5.24	6.35	5.32	5.17	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27–6.58	5.59	5.44	5.39	6.03	9.56	9.86	11.01	11.31
Houston	5.75	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35–10.45	10.50–10.60	11.50	11.95–12.10
Indianapolis	....	....	....	....	7.36	....	....	....	....	....	....	....	....
Kansas City	5.65	6.40	7.30	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.60
Los Angeles*	5.80	7.00	7.45[2]	5.85	7.35–7.85[16]	5.80	5.70	5.80	7.55	10.05	10.20	11.70	12.10
Memphis	5.93	6.68	....	5.98	6.80	6.08	5.93	5.68	....	....	....	....	....
Milwaukee	5.19	5.94	6.84	5.24	6.32	5.34	....	5.14	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.85[1]	....	5.55[1]	6.90[1]	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.55–5.65	6.54–6.64	6.90–7.00	5.64	6.76[5]	5.70	5.45	5.65	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10	7.00	....	6.30	....	6.15	6.20	6.15	7.20	....	....	....	....
Omaha	....	....	....	....	....	....	....	....	....	....	....	....	....
Philadelphia*	5.30	6.20	6.70	5.65	6.29	5.45	5.25	5.50	6.31	9.35	9.65	10.80	11.10
Pittsburgh	5.05	5.80	6.70	5.20	6.00	5.20	5.05	5.00	5.75	9.25	9.55	10.70	11.00
Portland	6.60–7.10[1]	8.40[2]	8.20[2]	6.85[9]	....	....	6.50	6.45–6.45[9]	8.60[14]	12.00[18]	11.60[18]	....	....
Salt Lake City	5.85	6.70	8.75	7.45	8.75	6.10[3]	5.90	7.35[8]	8.75	....	....	....	....
San Francisco	6.25[11]	7.60[2]	7.50[2]	6.75[11]	8.25	6.15[11]	6.00	6.15[11]	7.80	....	....	....	....
Seattle	6.70[4]	8.15[2]	8.20[2]–8.35[2]	7.35[4]	....	6.35[4]	6.20[4]–6.25[4]	6.35[4]	8.50[14]	....	10.60[18]–11.60[18]	....	13.60[18]–14.60[18]
St. Louis	5.38	6.13	7.03	5.43	6.68–7.54	5.53	5.38	5.33–5.35	6.08	9.58	9.88	11.03	11.33
St. Paul	5.76	6.51	7.41	5.81	6.16–6.82	5.91	5.76	5.71	6.42	9.96	10.26	11.41	11.71

BASE QUANTITIES: (*Standard unless otherwise keyed on prices*).

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 1000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....
Birmingham	41.88	42.38	....	....	....
Buffalo	46.00	46.50	47.00	....	....
Chicago	46.00	46.50	46.50	47.00	....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	.....
Erie	46.00	46.50	46.50	47.00	.....
Everett	....	50.50	51.00	....	.....
Granite City	47.90	48.40	48.90	....	.....
Ironton, Utah	46.00	46.50	....	....	.....
Pittsburgh	46.00	46.50	46.50	47.00	.....
Geneva, Utah	46.00	46.50	....	....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	46.00	....	....	....	.....
Swedeland	48.00	48.50	49.00	49.50	.....
Toledo	46.00	46.50	46.50	47.00	.....
Troy, N. Y.	48.00	48.50	49.00	....	54.00
Youngstown	46.00	46.50	46.50	47.00	....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	50.50	51.00	....	60.90
Boston	Steelton	6.90	.....	....	....	....	....
Brooklyn	Bethlehem	4.29	....	52.79	53.29	53.79	....
Cincinnati	Birmingham	6.70	48.58	49.08	....	....	....
Jersey City	Bethlehem	2.63	....	51.13	51.63	52.13	....
Los Angeles	Geneva-Ironton	7.70	53.70	54.20	....	....	....
Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	....
Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	....
Philadelphia	Steelton	3.09	....	....	....	....	57.09
Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
San Francisco	Geneva-Ironton	7.70	53.70	54.20	....	.....	.....
Seattle	Geneva-Ironton	7.70	53.70	54.20	....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contact base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Manganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $73.50. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.

25% Si	17.00
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si)

0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35

Briquets — Contract price, cents per pound of briquet, delivered ,60% chromium.

Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% max. C	$1.09
0.50% max. C	1.05
9.00 min. C	1.04

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.65¢
Ton lots	9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo.	96¢
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb	
Ton lots	$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	$1.13
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton	$160.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa.	94¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Ton lots, packed, lump	11.75¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢

Boron Agents

Contract prices, per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$4.25
Bortam, f.ob. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed. Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
F.o.b. Wash., Pa.; 100 lb and over	
10 to 14% B.	.75
14 to 19% B.	1.20
19% min. B.	1.50
Grainal, f.o.b. Bridgeville, Pa. freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese—Boron 75.00% Mn. 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered	
Ton lots	45.00¢



Keystone's new Galvanized MB Wire offers improved corrosion resistance. It gives added life and strength to mechanical springs subject to rust and corrosion. This is due to Keystone's unique method of galvanizing the wire **before** it is cold-drawn. The drawing process smooths and hardens the galvanized finish, increasing its lasting qualities remarkably. Other advantages are its lustre-bright, shiny smooth finish . . . even, uniform temper . . . and high tensile strength.

Keystone is prepared to help solve any of your industrial wire problems. If special treatment is called for, Keystone's metallurgical research and testing facilities are available to supply the answers. We welcome your inquiry.

KEYSTONE
STEEL & WIRE CO.
PEORIA . . . ILLINOIS

Special Analysis Wire, Setting New Standards of Performance

Iron Age Introduces

Continued from Page 23



VAN H. LEICHLITER, assistant vice president of operations, American Steel & Wire Co.

Van H. Leichliter, veteran steelmaker with AMERICAN STEEL & WIRE CO. for 20 years, has been named assistant vice president of operations. Mr. Leichliter, who was employed in the Worcester, Mass., metallurgical laboratory of the company in 1930, now serves as general superintendent of the company's South Works in Worcester

John L. Taylor was made sales manager of the EDWARDS CO., INC., Norwalk, Conn. Mr. Taylor joined the organization in New York in 1924. For the past 14 years he has been located in Chicago, where he served as district manager and manager of the central division.

Oliver J. R. Troup, Jr., has been appointed sales engineer for the ATLAS CHAIN & MFG. CO. He will be assigned to the eastern Pennsylvania, New York and Maryland sales territories.

Johnson Roney II becomes BLACK, SIVALLS & BRYSON, INC. representative in the Florida area to handle safety heads and related products. Since 1948, Mr. Roney has acted as sales representative for manufacturing equipment firms.

H. J. Bannister was appointed representative for the BEDFORD TOOL & FORGE CO., Bedford, Ohio, in the Philadelphia area. **George Rellim** will represent the firm in New Jersey, and **A. C. Schwartz** in Ohio.

Another Bliss Original



Bliss 80" Hot Strip Down Coiler at the Carnegie-Illinois Gary plant.

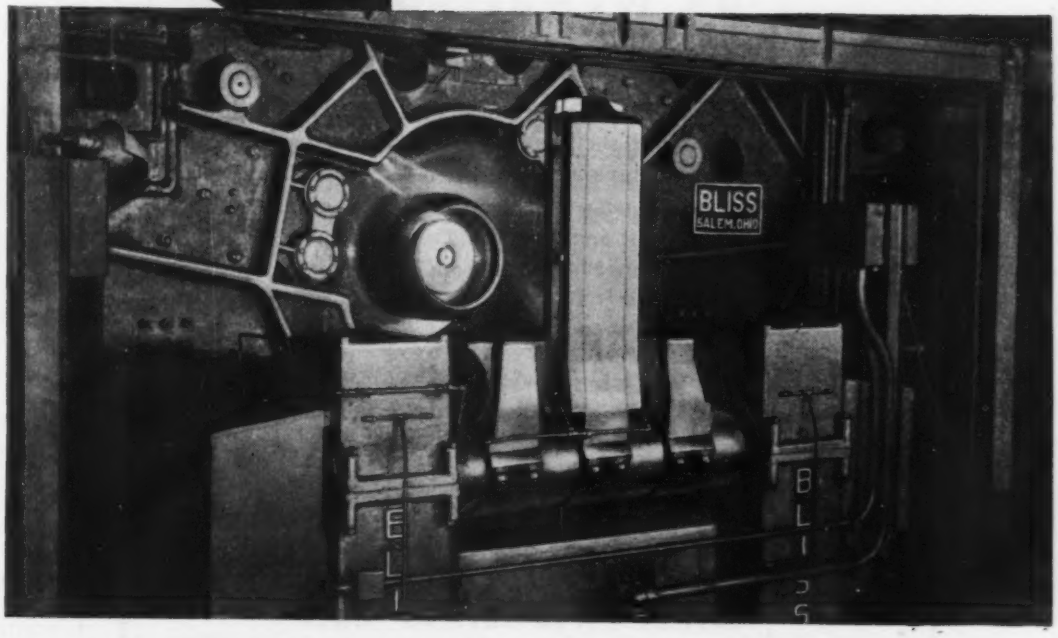
Tightly wound, smooth-edged coils that make for easy stacking and handling, quick ejection of finished coils, fast winding speed, extreme versatility as to gage and coil width, easy maintenance and minimum blocker roll wear—those are results this 80" Hot Strip Down Coiler gives. Engineered and built by Bliss for the Carnegie-Illinois Steel Corporation, it's the first design to use an expanding mandrel, which makes possible *all* these results.

There were engineers who said it couldn't be done for hot strip, but Bliss succeeded where others would not try.

Hot or cold rolling of ferrous or non-ferrous metals...2-, 3-, 4-high, or cluster mills ...Bliss builds them all to meet your requirements. For keen engineering counsel on rolling mills, as on presses, put your problem up to Bliss.

E. W. Bliss Company
General Office: Toledo 7, Ohio
Rolling Mill Division
Salem, Ohio

Action photograph of coiler producing a coil.



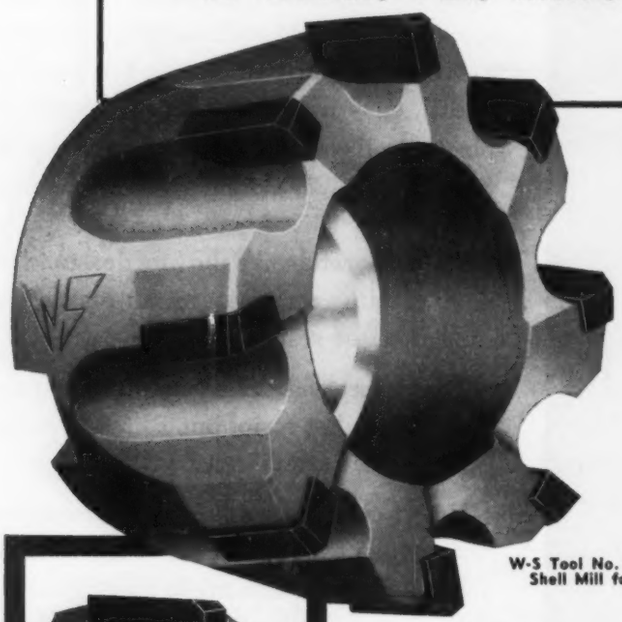
MARQUETTE • BLISS • CONSOLIDATED
BLISS BUILT
TOLEDO

ROLLING MILLS • PRESSES • CONTAINER MACHINERY

REMOVE UP TO

60 CUBIC INCHES

OF STOCK PER MINUTE



W-S Tool No. "BSSM" Eight-Tooth Shell Mill for machining steel.



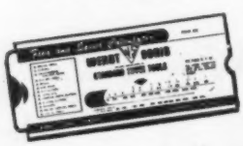
Carbide insert over-hang prevents diamond wheel from touching steel body when cutter is sharpened.

New

SHELL MILLS

BY WENDT-SONIS

Make way for faster cutting action with new W-S Shell End Mills, specifically designed for machining all types of steel, cast iron and non-ferrous metals, with stock removal up to 60 cubic inches per minute. These superior shell mills operate at much higher feeds and speeds than previous types of shell mills. More teeth in the cutters mean increased table feet per minute . . . more pieces per hour at less grinding cost and down time. Vibration-free operation. Available in a wide range of sizes from 1¼" to 6", with from 2 to 14 teeth.



FREE! W-S SPEED AND FEED CALCULATOR

Quickly figures feed and speeds on reaming and other operations. Write WENDT-SONIS Company, Hannibal, Missouri.

WENDT SONIS

CARBIDE TIPPED CUTTING TOOLS

BORING TOOLS • CENTERS • COUNTERBORES • SPOTFACERS • CUT-OFF TOOLS
DRILLS • END MILLS • FLY CUTTERS • TOOL BITS • MILLING CUTTERS • REAMERS
ROLLER TURNING TOOLS • SPECIAL BITS

IRON AGE INTRODUCES

Continued

Carter C. Higgins was elected president and general manager of the WORCESTER PRESSED STEEL CO., Worcester. **John W. Higgins,** president from 1912 to 1950, became chairman of the board and retained his position as treasurer. **Maynard F. Carter,** comptroller, replaced Mr. Higgins as secretary.



BERTON E. ROGERS, works manager, Winchester Repeating Arms Co.

Berton E. Rogers was appointed works manager of the WINCHESTER REPEATING ARMS CO, New Haven, Conn., a division of Olin Industries, Inc. In coming to Winchester, Mr. Rogers relinquishes his post as works manager of the Olin plant in East Alton, Ill.

John J. Fetsko, Jr., has been named regional manager in charge of all inland waterways Diesel sales for the Superior Engine division of the NATIONAL SUPPLY CO., Pittsburgh. Mr. Fetsko will make his headquarters in the Superior Engine division's office in St. Louis. Prior to his appointment, he had been sales engineer for the division in New Orleans.

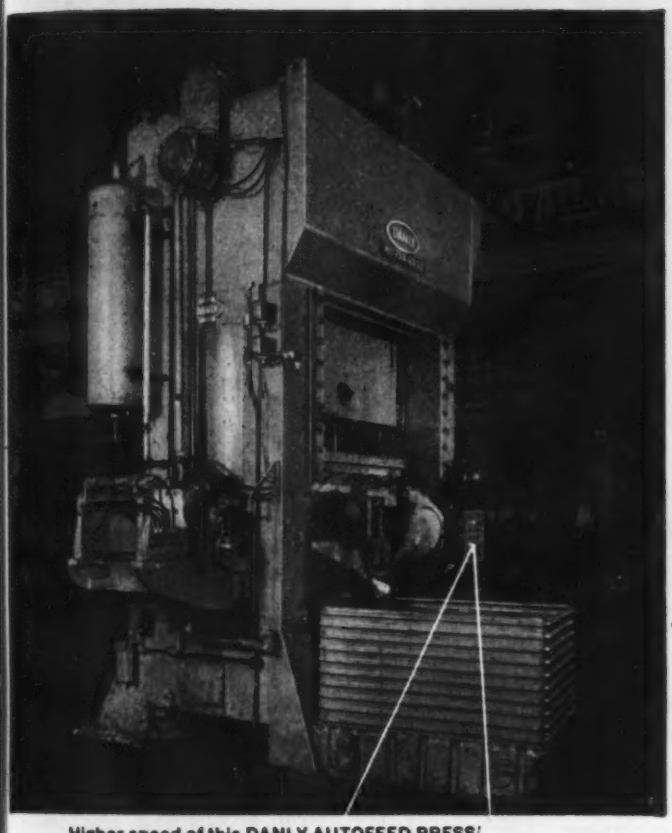
John H. Smith was elected president, succeeding **John J. Clough,** who becomes chairman of the board of directors, of the GENERAL ELECTRIC X-RAY CORP., Milwaukee. Mr. Smith is also president, and Clough, chairman of the board, of GENERAL ELECTRIC MEDICAL PRODUCTS CO., subsidiary of the company.

Charles Calvin Christy was named assistant purchasing agent of LACLEDE-CHRISTY CO., St. Louis. He succeeds **B. N. Wright,** who is being added to the St. Louis district sales staff.

50% LONGER DIE LIFE ON THIS

DANLY

autofeed



Higher speed of this DANLY AUTOFEED PRESS made a 50% increase in die life possible!

50,000 parking lamp mounting brackets stamped before die change!

Presses work hard in this large automotive plant . . . shift averages up to 7500 pieces are achieved on this Danly Autofeed! Notching, flanging, trimming, piercing and cut off operations are performed on each stroke of the press.

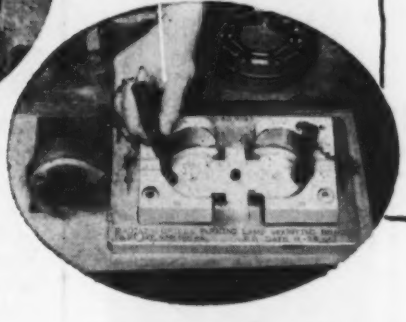
Variable and higher speed of the Danly Autofeed Press on this job is the key factor in making this remarkable die life improvement possible. Experimentation with various operating rates showed that higher speeds meant 50% longer die life. Higher speeds are possible with Danly Autofeed Presses because of heavier construction and greater resistance to vibration and deflection.

But this significant advantage is only one of the cost reducing features of Danly Autofeed Presses. For another, the new Danly cool-running clutch greatly reduces the most important single item of press operating cost, clutch maintenance.

Danly Autofeed Presses are available from 50 to 800 tons, offering the advantages of automatic feeding over a greatly expanded tonnage range.



Close up of the die setup. Two finished pieces, one right and one left, are produced per stroke.



View of inspection operation showing precision gaging of the parking lamp mounting brackets produced.

SEND FOR THIS FREE BOOKLET

And see how DANLY AUTOFEED PRESSES are certain to reduce stamping costs in your plant!



CHECK THESE

EXCLUSIVE *DANLY* PRESS FEATURES

- ✔ cool-running clutch
- ✔ extra rigidity
- ✔ complete pressure lubrication
- ✔ special controls — sensitive reaction
- ✔ precision construction

Danly Machine Specialties, Inc., 2100 South 52nd Avenue, Chicago 50, Illinois

DANLY

MECHANICAL PRESSES...50 TO 3000 TONS

Fastening Operations Cost Less with an



Composition board and impregnated fibreboard being fastened together with the Acme-Morrison Metal Stitcher.

ACME-MORRISON METAL STITCHER



CROSS-SECTION VIEWS OF STITCHES

and are done faster . . . stronger . . . neater

If you fasten sheet metal to metal or any non-metallic material, here's why you should do the job with an Acme-Morrison Metal Stitcher:

1. ***To save time.*** **In one operation, forms its own stitch or staple from a continuous coil, drives it through the material, and clinches it at the rate of 280 per minute.**
2. ***To save material.*** **Replaces rivets, screws, nails, bolts and spot welding with inexpensive wire stitches.**
3. ***To save money . . .*** **by increasing production, eliminating costly, unnecessary operations. No pre-punching, pre-drilling, matching or inspection required.**

For example: A furnace manufacturer cut an assembly cost from 17½c to 3½c per unit by replacing rivets with wire stitches. A maker of insecticide spray guns reduced his labor costs 38%, and cut material costs 91%, by replacing two screws with wire stitches.

Find out how similar savings can be applied to your assembly line. Mail the coupon today.

STITCHING WIRE DIVISION

ACME STEEL COMPANY

NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 11

ACME STEEL COMPANY, Dept. IA-20
2840 Archer Avenue, Chicago 8, Illinois

☐ Send booklet on "*Metal Stitching.*"
☐ Have representative call.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____



Aluminum, leather and copper stitched together

Aluminum, plywood and brass stitched together

Textile stitched to aluminum

IRON AGE INTRODUCES

Continued

Hollis I. Conner has been appointed assistant manager of the export division of the HYSTER CO., Portland, Ore. He will serve as head of the company's Peoria, Ill. export department and as contact man between headquarters in Portland and Hyster's two eastern plants.



CURTNER B. AKIN, manager, mechanical tubing department, National Electric Products Corp.

Curtner B. Akin has been made manager of the mechanical tubing department of NATIONAL ELECTRIC PRODUCTS CORP., Pittsburgh. He comes to the post from the SERVICE STEEL CO., where for the last five years he sold steel tubing throughout the Detroit area.

E. K. Brown, formerly chief engineer of the Torrington Needle Bearings division, has been appointed director of research for the TORRINGTON CO., Torrington, Conn. This department will be expanded to encompass research work in the design and development of new products. **B. T. Virtue** will succeed **Mr.** Brown as chief engineer of the needle bearings division.

Edward A. Weymouth was made manager of sales and **Arthur H. Paden,** assistant manager of sales, of the PITTSBURGH LIMESTONE CORP., a U. S. STEEL subsidiary. Mr. Weymouth has been with the firm in sales engineering since 1939, while Mr. Paden joined the company in 1921.

Thomas J. Kelley, Jr., consultant in the jail and prison division, DECATUR IRON & STEEL CO., INC., Decatur, Ala., has been promoted to vice president.



ERIC A. FLASCHAR, president, Stacey Bros. Gas Construction Co.

Eric A. Flaschar was elected president of the STACEY BROS. GAS CONSTRUCTION CO., Cincinnati, to succeed **William E. Gruening. Arthur E. Harvey** was advanced from vice president to executive vice president, and **Herbert C. Brinkman** was elected vice president.

J. D. Murphy was appointed industrial supervisor in the Buffalo office of the WESTINGHOUSE ELECTRIC CORP. Mr. Murphy, who has been located in the company's Syracuse, N. Y., office succeeds **Frank E. Heikkila**, who was transferred to the East Pittsburgh, Pa., plant as assistant industrial sales manager.

L. C. Grimshaw has been appointed assistant chief metallurgist at FIRTH STERLING STEEL & CARBIDE CORP., McKeesport, Pa. Mr. Grimshaw was formerly associated with LATROBE ELECTRIC STEEL CO. for 17 years, where for the last four years he was chief metallurgist.

Alex Lobbestael has been appointed acting manager of FORD MOTOR CO.'S Parts and Equipment Mfg. division plant at Ypsilanti, Mich. Mr. Lobbestael takes over the duties of Alex Hunter, who recently was made manager of the division's newly acquired plant at Monroe, Mich.

Melvin O. Monsler was appointed sales manager of the P&H Welding division, HARNISCHFEGER CORP., Milwaukee. Mr. Monsler has been associated with the firm for 12 years, serving for four years as assistant sales manager of that division and one year as welding product service engineer. He also held the posts of welder and assistant to the superintendent.

CUTTING-OIL RECOVERY
can pay for
an **AMERICAN**
TURNINGS
CRUSHER





Reducing long, curly turnings of steel, alloys, brass, aluminum, etc., to uniform chips—with an American Turnings Crusher—increases cutting oil reclamation to 30-50 gallons per ton!

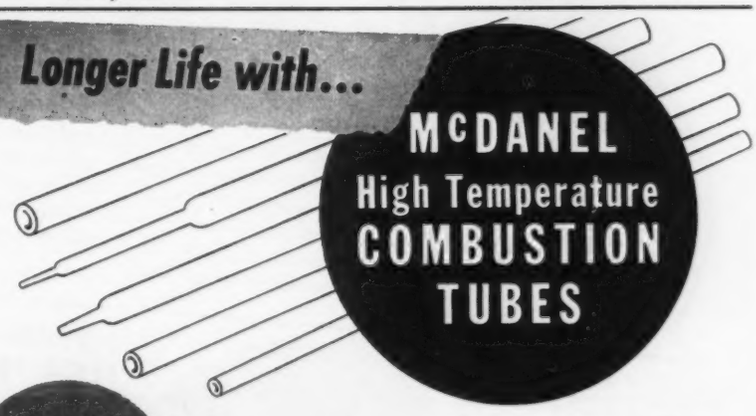
The higher scrap value of short shovel chips . . . and the savings in storage and handling too—these are additional reasons why Americans buy themselves . . . again and again!

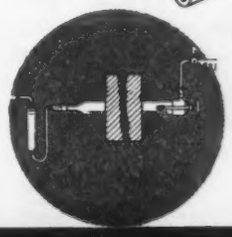
Segregated turnings are reduced to uniform chips by an American Shredder Ring Crusher for highest cutting oil recovery at the Crown Cork and Seal Co., Baltimore.

Write for informative bulletin—*Reducing your Turnings with an American.*

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1439 MACKLIND AVE.
ST. LOUIS 10, MO.

Longer Life with...
McDANEL
High Temperature
COMBUSTION
TUBES





McDanel Porcelain Combustion Tubes and Zirco Tubes are precision made. Density, bore size, wall thickness, etc. are carefully controlled to assure maximum resistance to thermal shock, accurate fit and gas tightness. Cast as a single unit, they defy devitrification—give longer service and lower replacement costs. For carbon and sulphur determinations, McDanel Tubes are *tops.*

Leading metallurgists in the steel and iron industries say: "McDanel Tubes stand up well under extremes in temperature"—"Never spall or blister"—"Highly satisfactory in every respect".

Specify McDanel High Temperature Porcelain Combustion Tubes and Zirco Tubes from your supplier.

OTHER McDANEL PRODUCTS

- Non-spalling, non-blistering, gas tight Combustion Tubes.
- High Temperature Zirco Tubes.
- Self Cooling Combustion Tubes.
- Refractory Porcelain Specialties in stock or designed to meet your needs.

McDANEL
Refractory
Porcelain Co.
Beaver Falls
Penna.

KENNAMETAL
Developments for Reducing Cost of Manufacturing and Servicing Chilled Iron Rolls

ROUGHING and FINISHING TOOLS for Plunge Feed Lathes



STYLE RT

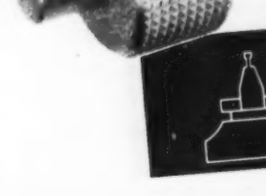
STYLE RRT

Style RRT (above) has replaceable solid Kennametal cylinders that can be turned on their axis to provide a multiplicity of cutting edges; Style RT (right) has a solid Kennametal blade that provides four successively available cutting edges. Standard widths, both tools—4", 6", 8", 10"

These rugged, durable Kennametal tools cut machining time in half, on chilled cast iron rolls. Style RRT slices through scale easier, permits faster speeds and huskier feeds, trues up a roll quickly. Style RT gives superior finish that requires little or no grinding. Exclusive features include: (1) Kennametal cutting edges that stay sharp up to 100 times as long as steel; (2) Exceptional strength that stands gaff of crashing through scale, chill balls, and burned spots; (3) Simplified maintenance—resharpening simply requires squaring off the cutting edges. Ask our field engineer to demonstrate.

The ground-in knurls of this solid Kennametal wheel keep their shape far longer than those on steel wheels—performance reports indicate as much as 100 times the service before regrinding is necessary. Made on order to customer's specifications.

SOLID KNURLING WHEEL



CLAMPED-IN BLADE TOOL for Longitudinal Feed Lathes



STYLE LRT

This tool employs the proved Kennametal mechanically-held principle. Its width is 2½", and like the Style RT tool shown above its blade has four cutting edges that can be used before any sharpening is required. Then the cutting edges are squared off, and the blade can be advanced after each sharpening.

KENNAMETAL Inc.
LATROBE, PA.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

IRON AGE INTRODUCES

Continued



ROBERT OSBORN, district manager of the Chicago territory, Peninsular Steel Co.

Robert Osborn was appointed district manager of the Chicago territory for the PENINSULAR STEEL CO., Detroit. Mr. Osborn succeeds **Norman B. McKeagan** who recently died. For the past several years Mr. Osborn has been in charge of the company's Akron warehouse.

Timothy E. Shea, president and a director of the Teletype Corp., Chicago, a subsidiary of the WESTERN ELECTRIC CO., INC., has been appointed personnel director of the parent company. He succeeds **Joseph R. Bransford** who was recently elected financial vice president of Western Electric. **John J. O'Brien,** vice president of Teletype Corp., has been elected to succeed Mra. Shea, who has been with the company since 1920.

Frank E. Kearney was elected vice president and a director of the J. LEO COOKE WAREHOUSE CORP., Jersey City, N. J. Mr. Kearney resigned as general sales manager of the LEHIGH WAREHOUSE & TRANSPORTATION CO., Newark, N. J., with which he had served for 17 years, to accept the new affiliation.

F. H. Clark has been named sales manager for the Standard Control division of the WESTINGHOUSE ELECTRIC CORP., at Beaver, Pa. He has been associated with Westinghouse since 1942.

Joseph H. Reid will direct all activities of the titanium division of the NATIONAL LEAD CO., New York. He takes over the position formerly held by **D. W. Robertson,** who will continue in a consulting capacity.

Turn to Page 148



turn into more dollars for you!

● Fabricators using light gauge cold rolled strip steel can often increase yield per ton by specifying CMP Thinsteel. Uniformity in coil after coil assures constant control of your production costs. But your original estimates as to steel weight requirements for a given job and blanks per hour of press time can be badly upset by unlooked for gauge variations or lack of uniformity in any number of characteristics if your choice of flat rolled product is not entirely reliable. You can depend on CMP Thinsteel—the product of a specialized strip producer. CMP Thinsteel has all the precision characteristics of gauge accuracy and uniformity of finish, edge and width typical of a *true* strip product as contrasted with cold rolled sheet products slit to strip widths. We'll be glad to run CMP Thinsteel on a competitive production test at any time against an equal weight of slit sheets in the same ordered gauge range.

don't pay for steel.... you don't get paid for

When you buy steel by the pound and sell it by the foot or piece you want maximum yield per ton. CMP is famous for delivering the close gauge tolerance and other precision characteristics that assure more feet per pound—more finished parts per ton; in low carbon, spring steel, stainless and alloy grades, and electro-zinc coated.

EXTRA-LONG COILS . . . . . less downtime
EXTREMELY CLOSE TOLERANCES . more parts per ton
WIDE RANGE OF PHYSICALS AND ANALYSES . . . . . tailored to your needs
GAUGES AS THIN AS .001" . strength with lightness

CMP the **Cold Metal Products co.**
YOUNGSTOWN 1, OHIO

NEW YORK • CHICAGO • DETROIT • ST. LOUIS • INDIANAPOLIS • LOS ANGELES

Announcing...

A Complete Line
of
Spray, Dip and Brush
PHOSPHATE COATING CHEMICALS
for
PAINT-BONDING
RUST PROOFING
and DRAWING

Paint-Bonding **"Granodine"** — zinc phosphate coating chemicals, applied by spraying, dipping, or brushing in a cold, medium, or hot process, improve paint adhesion on steel, iron, and zinc.

"Lithoform" — zinc phosphate coating chemical, applied by spraying, dipping, or brushing at room temperature, makes paint stick to galvanized iron, zinc and cadmium.

Rust Proofing **"Permadine"** — zinc phosphate coating chemical, applied in an immersion process forms an oil-absorptive coating on iron and steel that bonds rust-inhibiting oils such as **"Granoleum."**

"Thermoil-Granodine" — manganese phosphate coating chemical, applied in an immersion process, forms a dense crystalline coating on iron and steel which, when oiled or painted inhibits corrosion and when oiled protects friction surfaces.

Drawing **"Granodraw"** — zinc phosphate coating chemical, used in an immersion process, facilitates the mechanical deformation of steel.

Write for further information on any of these phosphate coating chemicals and processes and how they can be adapted to your production.

Pioneering Research and Development Since 1914

AMERICAN CHEMICAL PAINT COMPANY

AMBLER, PA.

Manufacturers of Metallurgical, Agricultural and Pharmaceutical Chemicals

Dear Editor

BOLT PRICES

I cannot lay aside the January 5 issue of THE IRON AGE without saying a most complimentary "thank you" for the paragraph in the article on p. 15 referring to bolt prices. You have told the story as eloquently and in as few words as could possibly be done.

C. L. TURNER
Vice President
Buffalo Bolt Co.
North Tonawanda, N. Y.

BRITISH STEEL MILL

Will you kindly give the writer information as to what manufacturer is making and installing the new steel making and mill rolling facilities that will be installed in South Wales, Eng. Will it include open hearth furnaces made in the U.S.A.?

K. C. PHELPS
Alameda, Calif.

United Engineering & Foundry Co., Pittsburgh, is supplying both the hot and cold mills, and in fact, the dominant proportion of the entire mill equipment. A rather complete article on this plant, entitled "British Steel Mill To Utilize U. S. Materials & Techniques" appeared on page 119 of the January 29, 1948 issue.—Ed.

DIE TABLE

In going through some back issues of THE IRON AGE, we ran across a cut showing a hydraulic die table made by Lyon-Raymond Corp., and would like very much to have the address of this company.

C. A. HAMPLE
Factory Manager
Canadian Cooperative Implements, Ltd.
Winnipeg, Man.

Lyon-Raymond Corp. is located in Greene, N. Y.—Ed.

GAS CYLINDER TESTS

This office would be greatly interested in obtaining the U. S. Government regulations regarding tests of containers (cylinders) used for the storage of compressed, liquefied or dissolved gases.

LT. COMMANDER PERRIN
Ass't Naval Attaché
French Embassy
Washington

Government regulations regarding tests of gas cylinders are contained in Freight Tariff No. 4, published by the Interstate Commerce Commission. A copy of these regulations may be obtained for $2.00 from Mr. H. A. Campbell, Chief Inspector, Bureau of Explosives, 30 Vesey St., New York.—Ed.

FREE

PUBLICATIONS

Continued from Page 34

specifications available for numerous uses. *Harrisburg Steel Corp. For more information, check No.* 11 *on the postcard on p.* 35.

Hydraulic Equipment

A new 36-p. edition of "Hydraulic Tables," for designers and users of hydraulic equipment, includes capacities of hydraulic rams, displacements of single-acting plungers, steel pipe tables, including water flow rates, friction losses of fittings, and bolt strength and size data, in addition to other useful engineering information. *Baldwin Locomotive Works. For more information, check No.* 12 *on the postcard on p.* 35.

Power Tools

The entire 1950 line of Duro power tools is described in an 8-p. brochure containing illustrations, capacities, specifications and prices of more than 30 power tools for industry, farm and home. *Duro Metal Products Co. For more information, check No.* 13 *on the postcard on p.* 35.

Speed Reducers

Available in 65 sizes, continuous tooth herringbone gear speed reducers ranging in ratio from 2 to 360 to 1 with capacities up to 3500 hp are described in a new 44-p. catalog giving horsepower ratings, overhung load capacities, dimensions and weights of single, double and triple reductions. *D. O. James Gear Mfg. Co. For more information, check No.* 14 *on the postcard on p.* 35.

Solid Tires

The complete range of Monarch industrial solid rubber tires for gasoline and electric fork trucks, as well as platform, crane, ram, sheet handling tractor trucks and similar hand-powered vehicles are described in a 26-p. booklet, which also lists



SOL·SPEEDI·DRI

SPEEDI-DRI CORP.,



FREE SAMPLE:



FREE PUBLICATIONS

Continued

vehicle manufacturer's tire specifications. *Monarch Rubber Co. For more information, check No.* 15 *on the postcard on p.* 35.

Flexible Joints

Moran ball and swing flexible joints are described and illustrated in a 12-p. catalog listing specifications and prices as well as numerous applications. *Moran Flexible Joint Co., Inc. For more information, check No.* 16 *on the postcard on p.* 35.

Grinding Machines

Cincinnati 14 and 16-in. Filmatic plain grinding machines, featuring electronically controlled table reverse, are described in a 12-p. catalog containing dimensional drawings and listing specifications. *Cincinnati Grinders, Inc. For more information, check No.* 17 *on the postcard on p.* 35.

Plastic Tubing

Complete information on the variety of formulations of Tygon modified vinyl plastic tubing, its uses, properties and chemical resistant characteristics, are described and illustrated in a 24-p. bulletin. *U. S. Stoneware. For more information, check No.* 18 *on the postcard on p.* 35.

Gear Speeder

Several models of Red Ring gear sound testers are shown in a 4-p. illustrated folder, which also explains the character of gear noises and their interpretation, and lists gear speeder dimensions and capacities. *National Broach and Machine Co. For more information, check No.* 19 *on the postcard on p.* 35.

Oil Industry Hose

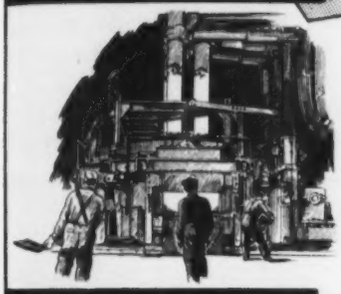
Reprene wire-interwoven hose for all operations involved in the production and handling of petroleum and petroleum products are described in a 12-p. booklet showing construction details and specifications. *Republic Rubber Div., Lee Rubber and Tire Corp. For more information, check No.* 20 *on the postcard on p.* 35.

Resume Your Reading on Page 35

RIGHT HERE



AND HERE . . .



ARE WHERE

Baker's Magdolite

PAYS OFF!

OPEN hearth and electric furnace superintendents, who have used *Baker's Magdolite*, know from experience that this superior Refractory produces *uniform ingots* . . . in *greater numbers* . . . at *lower fuel costs* . . . with *less defective material.*

Baker's Magdolite, the *original* dead-burned dolomite, should be your choice because it assures you of *minimum* maintenance and repairs. Write for complete information. *The J. E. Baker Company, York, Pennsylvania.* Plants: Billmeyer, Pa., and Millersville, Ohio.

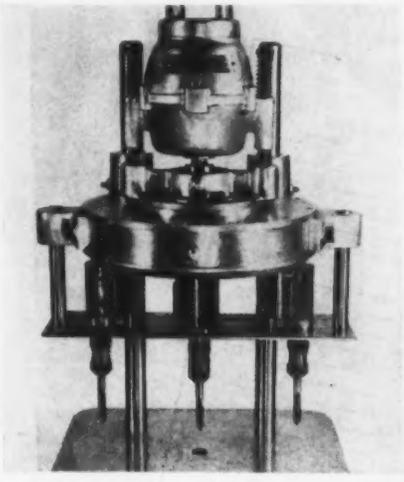
JEBCO PRODUCTS SINCE 1889 — 61 YEARS OF SERVICE

NEW

PRODUCTION IDEAS

Continued from Page 38

center distance of 7⅜ in. Spindle can also be located at any point within a 3 5/16-in. diam. The template method simplifies locating spindles accurately for a given hole



combination and to change their location from one drilling or tapping operation to another. The head is available with 2, 3, 4, or 5 spindles. *Ettco Tool Co. Inc. For more information, check No.* 34 *on the postcard on p.* 35.

Rotary Work Aligner

For handling materials requiring rotation in manufacture, assembly, welding or repair, a new rotary



work aligner insures perfect alignment of two or more pieces of work, and eliminates expensive setups for miscellaneous jobs. It is adapted to either centered or uncentered work and checks alignment or runout on any circular

CUT WELDING COSTS 26.3%* with



Norelco CONTACT WELDING ELECTRODES

● With this entirely *new type* of rod, welding speeds are increased an average of 45%. Welding is made much easier by touch-welding in all positions; and quality uniformly improved through less distortion, undercutting, and better control.

Available in two types: Contact 18 (in conformance with AWS E6013 class) for fast all-position general-purpose welding, and Contact 20 (AWS 6020 class) for extremely fast production welding in horizontal and downhand positions. Both AC or DC.

Norelco CONTACT WELDING ELECTRODES

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New York 17, N.Y.

The ABC of MST

A LWAYS MAKES POSSIBLE
B ETTER PRODUCTS
C AT LOWER OST

Michigan
The Modern Electric Resistance
WELDED STEEL TUBING

A Quality Product

Standard Sizes

Tube Diameter O.D. Size	Maximum Wall BWG Decimal	Gauge	Minimum Wall BWG Decimal	Gauge
¼	.049	18	.028	22
⅜	.065	16	.022	24
½	.083	14	.022	24
⅝	.095	13	.022	24
¾	.095	13	.022	24
⅞	.095	13	.028	22
1	.095	13	.028	22
1⅛	.095	13	.028	22
1¼	.095	13	.028	22
1⅜	.095	11	.035	20
1½	.120	11	.035	20
1⅝	.120	11	.035	20
1¾	.120	9	.035	20
1⅞	.148	9	.035	20
2	.148	9	.035	20
2⅛	.148	11	.035	20
2¼	.120	9	.035	20
2⅜	.148	11	.035	18
2½	.120	9	.049	18
2⅝	.148	9	.049	18
2¾	.148	9	.049	18
2⅞	.148	9	.049	18
3	.148	9	.049	18
3⅛	.148	9	.049	16
3¼	.148	9	.065	16
3⅜	.148	9	.065	16
3½	.148	9	.065	16
3⅝	.148	9	.065	16
3¾	.148	9		
3⅞	.148			
4	.148			

Can be Bent ... FLANGED, EXPANDED, TAPERED, DEPRESS BEADED, EXPAND BEADED, ROLLED, EXTERNAL UPSET, INTERNAL UPSET, FLUTED, SPUN CLOSED, FORGED, BEVEL FLANGED, FLATTENED, SWAGED

ROUND
¼" to 4" O. D. 9 to 22 gauge
SQUARE-RECTANGULAR
½" to 2" 20 gauge 1" to 2¾", 14, 16, 18 gauge
Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Michigan STEEL TUBE PRODUCTS CO.
THE OLDEST NAME IN ELECTRIC RESISTANCE WELDED STEEL TUBING
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FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland, Dayton, Ohio—Dirks & Company, Portland, Oregon—James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—American Tubular & Steel Products Co., Pittsburgh, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio

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material from ¼ to 24-in. diam. Two or more work aligners may be used in handling long sections. Four models are being produced in bed lengths from 5 ft 10 in. to 11 ft 6 in. with a load capacity of 1500 lb. *Johnson Machine Works. For more information, check No. 35 on the postcard on p. 35.*

Permanent Mold Machine

This permanent mold machine can be used for the production of castings poured of steel, cast iron, malleable iron, nodular iron, brass, bronze, magnesium and aluminum.

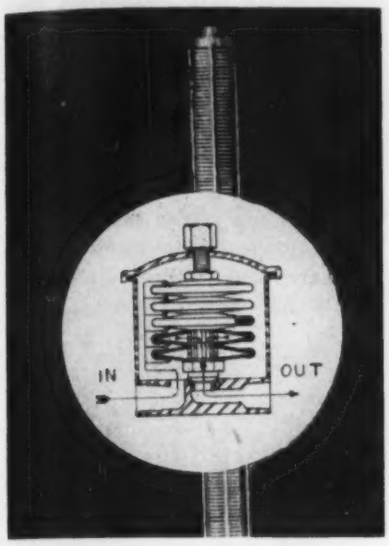


A feature of the machine permits the operator to place the core in the drag half of the permanent mold while the parting line is in a horizontal plane. Either dry sand or green sand cores may be used. Mold sizes up to 22 in. wide x 26 in. deep can be accommodated. Castings up to 100 lb can be made. *Centrifugal Casting Machine Co. For more information, check No. 36 on the postcard on p. 35.*

Porous Stainless Filters

Low initial cost and ease of operation are provided in the new Surfamax porous stainless steel filters. Supplying a maximum filter area in a convenient small container, the permanent Micro Metallic units give continuous service with a minimum of maintenance expense and attention. The steel filter elements are in the form of corrugated assemblies, having the general shape of an accordion.

They are available in six pore openings, ranging from 5 microns (0.0002 in.) to 165 microns (0.0065 in.), providing high efficiency in



passing fluid and retaining solids. Standard units with pipe connections range from ¼ to 2 in. *Micro Metallic Corp. For more information, check No. 37 on the postcard on p. 35.*

Measuring Microscope

This low priced toolmaker microscope performs all functions of linear, coordinate and angular measurement. Range of measurement is 6½ in. and a workpiece can be surveyed in coordinates up to 6½ x

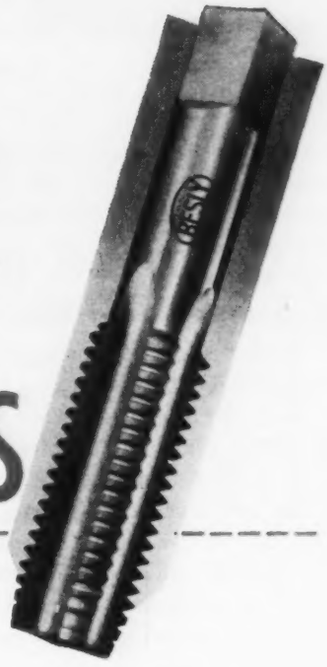


6½ in. The micrometer head uses a nonrotating spindle. Lead screw pitch is 20 T.P.I. Optical elements and microscope tube are of highest quality. Objective is achromatic lens of high resolving power. Eyepiece is Ramsden type. Overall magnification is about 32X. The stage with railings at 90° to each other can be operated free of con-

measured results like these can pay off for you, too . . .

WHEN YOU USE

BESLY TAPS



THE WORLD'S MOST ACCURATE TAP

*RESULTS—

*SAVES 50% ON TAPPING TIME

Original time for tapping two concentric holes in die-cast aluminum pistons was 18 seconds per piece—9 seconds per hole. By a unique arrangement in which the smaller Besly tap was fitted into the bored out center of the larger tap, two holes are now tapped simultaneously—a 50% saving in tapping time!

*RESULTS—

*TAPS 60 CRANKCASES PER HOUR

High-speed, close tolerance tapping of air-cooled, industrial and marine motor crank cases is accomplished at the rate of 60 per hour using Besly Taps. 24 stud fit bottoming holes are threaded in two crankcases at a time.

*RESULTS—

*GETS 100 HOUR TAP LIFE

Average life for Besly Taps exceeds 100 hours for a midwest faucet company. Chips are cleared on a three-pitch triple lead thread—at a spindle speed of 235 r.p.m. and a reverse speed of 2150 r.p.m.

UNSURPASSED ACCURACY at *all* vital points

Microcentric CHAMFER
Micro finish, concentric to tenths of thousands. Cuts freely and to size without burring or welding.

Solid Ground THREAD FORM
For angle and lead accuracy, eliminates gauging problems and control of pitch diameter to tenths of thousandths.

"Right" ROCKWELL
Taps pre-inspected for correct Rockwell hardness.

Mirror Finish FLUTES
Correct design to provide freer chip flow and longer tap life.

Tru-Square DRIVER
Square and shank fit correctly in chucks and holders. No wobble to cause oversize holes.

Measured results, however good, mean nothing to you unless they're applied to your particular tapping operation. Yet, Besly's proof of performance on helping others lower tapping costs, save time and labor, turn out close tolerance work to exacting specifications, on any material, can be your guide to better tapping results.

Test Besly Taps in your own plant. Ask for a Besly trial on your job. See your Besly Distributor.

*Name on request.

BESLY



TAPS—the world's most accurate tap. TWIST DRILLS AND REAMERS—Complete line for every need. TITAN ABRASIVE WHEELS AND DISCS—individually formulated for your job. GRINDERS that reduce costs on every type of surface grinding.

CHARLES H. BESLY & COMPANY

122 N. Clinton Street • Chicago 6, Illinois
Factory: Beloit, Wisconsin

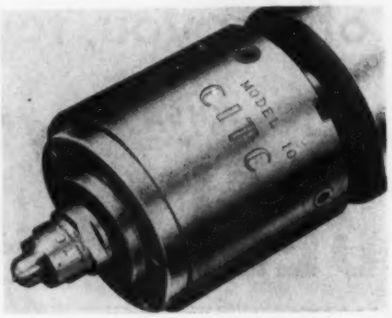
nection with the micrometer head. *Boeckeler Instrument Co. For more information, check No. 38 on the postcard on p. 35.*

Collet and Feed Fingers

A new process for salvaging collets and feed fingers makes it possible to reclaim used, worn collets and feed fingers and restore the precision of a new part. Carbide wear sections are inserted and ground to new collet dimensions. As the process involved in this reworking eliminates annealing, the original hardness and temper are not appreciably changed. *S & E Machine Products, Inc. For more information, check No. 39 on the postcard on p. 35.*

Diamond Turner

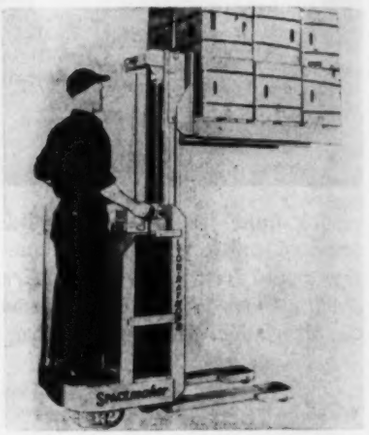
The new Citco hydraulic diamond turner is adjustable to three ranges of degrees. It turns and holds the diamond rigidly by hydraulic means, generates on the diamond



a definite and consistent sharp edge in any one of the three ranges, automatically repositioning the diamond every 3½, 7, or 10½° respectively. The turner becomes a permanent part of the machine maintaining a standard production between dresses, insuring maximum efficiency of both wheel and diamond. It converts down time used in turning and resetting diamond tools into production time. *Cleveland Industrial Tool Corp. For more information, check No. 40 on the postcard on p. 35.*

Tiering Truck

An electric tiering truck will tier from narrow aisles and areas, increasing useable floor and air space by narrowing aisles. Pallet loads 48x48 in. can be tiered at right



angles from a 6-ft aisle and 24x36-in. box skids can be tiered at right angles from a 5-ft aisle. Called the Spacemaker, the truck is lightweight, short and most maneuverable. Three different types include platform type for tiering skids, fork type for single face pallets, and straddle type for handling two faced pallets. *Lyon Raymond Corp. For more information, check No. 41 on the postcard on p. 35.*

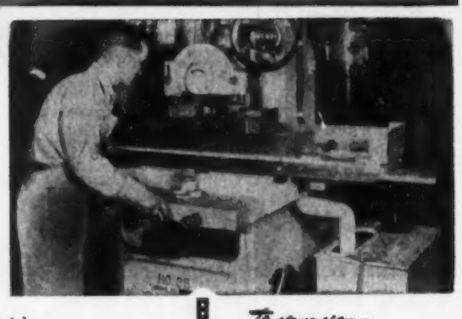
Steel Stacking Box

A new corrugated steel stacking box has a chain-operated hinged door that may be opened to any set



angle, simplifying parts disposal by standing or sitting workmen. Boxes are built to dimensions and load capacity specified by the cus-

Enthusiastic Customers do our BEST advertising



A Grand Rapids No. 35 Hydraulic Feed Surface Grinder at the Lakewood, Ohio, plant of V & S Die and Mold, Inc., who report, "It produces an exceptionally smooth finish, which is essential to us in our work."

You will appreciate the micro-inch finish produced at production speeds on Grand Rapids Grinders. All Grand Rapids Hydraulic Feed Surface Grinders have these outstanding features:

1. One-piece column and base casting for vibrationless rigidity
2. Precision ball-bearing spindle which is greased for life
3. Bijur one-shot lubrication system eliminating hand oiling
4. Patented vertical movement of wheel head for quick, accurate adjustments
5. Portable coolant tank for ease of coolant replacement
6. Vane type hydraulic pump for fast longitudinal table travel

To serve you—

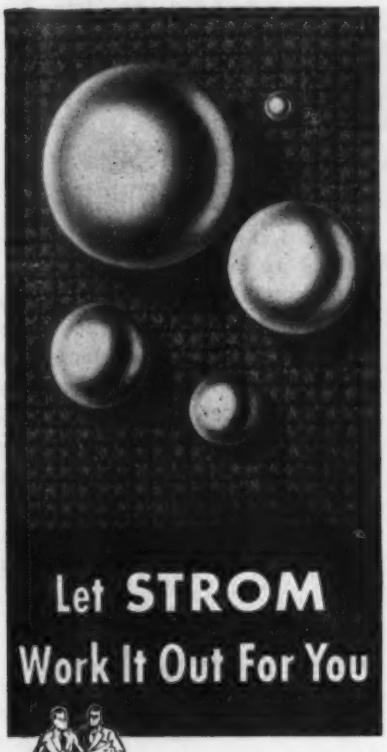
Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter and Tool Grinders, Hand Feed Surface Grinders, Drill Grinders, Tap Grinders, and Combination Tap and Drill Grinders.

GRAND RAPIDS GRINDERS

GALLMEYER & LIVINGSTON COMPANY

200 Straight, S. W., Grand Rapids 4, Mich.

a metal ball PROBLEM?





Whether it is a precision ball bearing or one of the other many ball applications in industry, your problem will not be entirely new. Strom has been in on many ball problems and knows the importance of the right ball for the job.

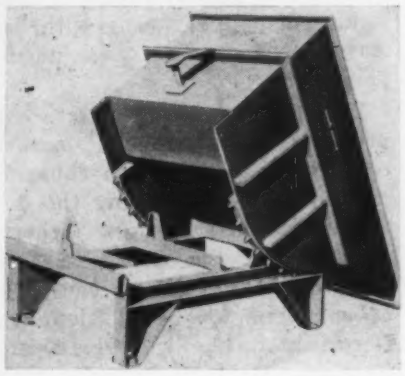
Strom has been making precision metal balls for over 25 years for all industry and can be a big help to you in selecting the right ball for any of your requirements. In size and spherical accuracy, perfection of surface, uniformity, and dependable physical quality, there's not a better ball made.

Strom
STEEL BALL CO.
1850 So. 54th Ave., Cicero 50, Ill.
Largest Independent and Exclusive Metal Ball Manufacturer

tomer. Crane lugs, stacking brackets and color of paint may also be specified. *Palmer-Shile Co. For information, check No.* 42 *on the postcard on p.* 35.

Self-Dumping Hoppers

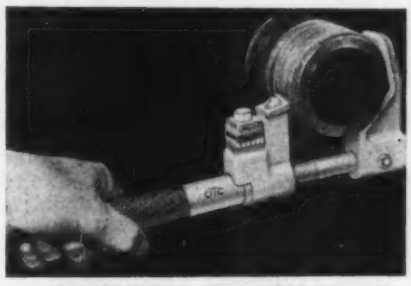
One yard capacity heavy duty self-dumping hoppers are built of ½ in. plate throughout and de-



signed to withstand warping when handling red hot sprues and castings. The hopper fits any standard type lift truck and can be unloaded by the operator of the truck by lifting the instant release handle. Other standard models come in ½, ¾, 1, 1½ and 2 cu yd sizes. They can be designed for flat trucks and with flanges to permit stacking. *Roura Iron Works. For more information, check No.* 43 *on the postcard on p.* 35.

Thread Chaser

An adjustable hand thread chaser to restore battered or crossed threads can be adjusted quickly to any diameter from 1¼ to 5 in.



and is suitable for use on axle housings or shafts, bearing cages, couplings, and pipes. The tool comes equipped with six chaser dies that carry 16 thread pitches. *Owatonna Tool Co. For more information, check No.* 44 *on the postcard on p.* 35.

Resume Your Reading on Page 39

AIRCRAFT QUALITY Alloy Steels

AVAILABLE FOR IMMEDIATE SHIPMENT FROM OUR CHICAGO WAREHOUSE.

SPECIFICATIONS

AMS 6260
AMS 6270
AMS 6272
AMS 6280
AN-S-14A
AMS 6324
AMS 6415
AN-QQ-756A
AMS 6320 (Hex)

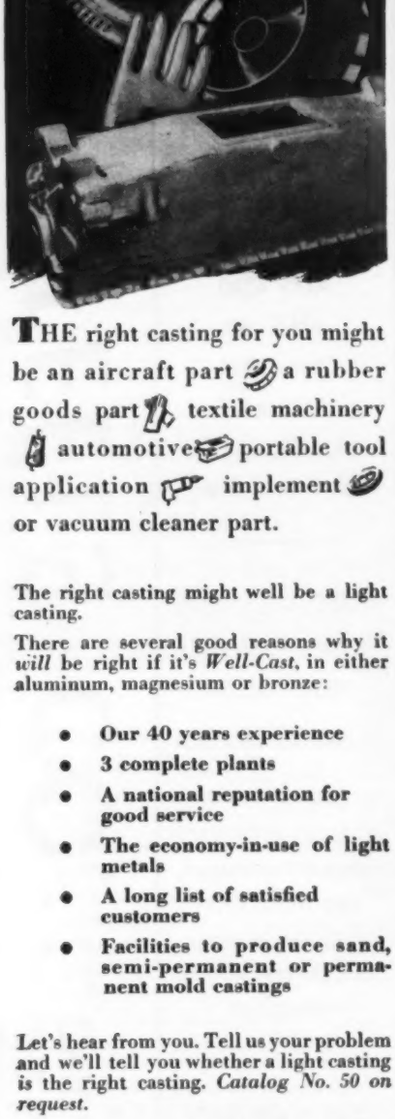
ROUNDS—HEXAGONS
COLD DRAWN
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WE SEND A CERTIFIED ANALYSIS WITH EVERY AIRCRAFT SHIPMENT, AND THE RESULTS OF JOMINY HARDENABILITY TESTS WHERE NECESSARY.

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HY-ALLOY STEELS CO.
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RAN. 6-5253

A Light Casting
Is the Right Casting
if it's Well-Cast



THE right casting for you might be an aircraft part a rubber goods part textile machinery automotive portable tool application implement or vacuum cleaner part.

The right casting might well be a light casting.

There are several good reasons why it *will* be right if it's *Well-Cast*, in either aluminum, magnesium or bronze:

- Our 40 years experience
- 3 complete plants
- A national reputation for good service
- The economy-in-use of light metals
- A long list of satisfied customers
- Facilities to produce sand, semi-permanent or permanent mold castings

Let's hear from you. Tell us your problem and we'll tell you whether a light casting is the right casting. *Catalog No. 50 on request.*

Well-Made Wood and Metal Patterns

THE WELLMAN
Bronze & Aluminum Co.
2511 EAST 93rd STREET
CLEVELAND 4, OHIO

European Market Source Of Unusual Machine Tools

New York—America must import products to get a return on the goods, services and money sent to Europe under the Marshall Plan. It would be inadvisable, however, to import products that would compete seriously with domestic products and cause unemployment.

In an effort to discover what products the European market could offer to American consumers, without endangering the domestic market, George Scherr, president of the George Scherr Co., New York, made a recent tour of machine tool exhibitions in Germany, Italy, Switzerland and Belgium.

From the hundreds of products on display, he selected for distribution a number of machines which are new or different in their application from anything on the American market. Among these is a tooth polishing machine which uses a wooden disk specially prepared with rouge to polish the teeth of pinions or gears in order to remove the slightest roughness after cutting.

Koppers Co. Sales Down in '49

Pittsburgh—Strikes in customer industries, plus rising materials and labor costs helped to reduce sales volume and income of Koppers Co., Inc., during 1949.

Sales during the year were $191,386,841, and total income was $192,314,685. Net earnings were $7,111,997, equivalent to $4.03 per share. In 1948, total income was $200,852,859, and net earnings $10,552,825, equivalent to $6.15 per share.

Steel Expansion Conditional

San Francisco — Benjamin F. Fairless, president of U. S. Steel Corp., interviewed by an alert shipping reporter as he sailed for Honolulu last week, said that U. S. Steel might begin planning next year for increased steel production in the West if this area continues its growth. He was quoted as saying, "It is our policy to keep capacity ahead of demand. While we have no immediate plans for increasing western ingot capacity, another year might require us to make such plans."

Kennecott Copper Signs New Agreements With Unions

Salt Lake City—The numerous unions representing employees of Kennecott Copper Co.'s Utah copper division are signing new agreements providing for an increase of 40¢ per day or five cents per hour. The most recent to sign were two locals of the International Union of Mine, Mill & Smelter Workers representing about 2500 open pit miners and mill workers. The company deals with 13 different unions.

Lower Prices and Production Decrease Sales and Inventory

Washington—Both sales and inventories of manufacturers declined during 1949, partly because of declining prices but also because of somewhat lower physical production, the Office of Business Economics reports.

Total manufacturers' sales were estimated at $213 billion, down 6 pct below 1948. Only motor vehicle sales, up 15 pct, and other transportation equipment including aircraft, up 5 pct, showed more than small increases.

Manufacturing year-end inventories were estimated at about $31 billion, a decline in book value of slightly more than $3 billion. Heaviest decline was in durable goods.

Coast Firm Buys in East

Los Angeles — Reversing the trend of Eastern companies opening West Coast plants, the Standard Steel Corp. of Los Angeles has purchased the Drying Machinery Div. of Hersey Mfg. Co., Boston.

The outright purchase included possession of the Boston dryer plant of Hersey and the latter's designs, patents and techniques.



Dear Customer

by Jack R. Light

HIGH FINANCE — We once listened to a correspondent of the hostile *Chicago Tribune* ask the British Chancellor of the Exchequer a honey on costs. The question asked how much nationalization of industries had cost the British Government to date, and how much more it was likely to cost. The answer came without hesitation, and about like this:

"Young man, in every case we have exchanged common stock certificates with government stock certificates, redeemable only at some unspecified date in the future. In other words, we exchanged one scrap of paper for another. It has cost us nothing. And that, I might add, is the essence of high finance."

That was slick—got him off the hot spot. The next best job we have seen done in explaining mystical high finance has been done in two booklets by the National Machine Tool Builders' Assn. They are entitled "Computing Return on Invested Capital—A Study in Machine Tool Arithmetic," and "The World's Best Investment."

The first, the arithmetic guide, explains that between the production superintendent and the financial wizard of a typical company, neither knows too much about how to chart the savings of buying a new machine tool.

The second volume points out how carefully an investment firm studies the potentialities of those securities in its portfolio. It points out that a metalworking firm should be making an equally keen study of its machine tool portfolio at all times, to make sure that it is replacing when replacement means profits. These explanations in both books are designed to serve the small firm and large one alike. They are illustrated, and come with a sample work sheet incorporated to make it simple to the reader to study his own machine tools.

Because they are destined to be among the *most useful* books for thousands of metalworking plants in this country and abroad—we will name these two books together for our Dear Customer honor roll for books published in the metals industry. They don't have slick plastic covers on them, but for sheer utilitarian value, we have a feeling that they can not be matched.



Steel Plate Fabrication Plant To Be Completed by March 1

Los Angeles—Full operation of Consolidated Western Steel Corp.'s new steel plate fabricating shop at Orange, Tex., is expected by March 1, according to H. C. Cranfill, vice-president in charge of administration for this U. S. subsidiary.

In spite of unseasonal weather, conversion of shipyard properties located adjacent to Consolidated's present structural steel fabricating plant at Orange is ahead of schedule with two construction crews totaling 300 men at work.

Some plate fabrication is being carried on now with part of the plate mill in operation and assembly of additional units under way.

Thirty-one ft lengths of 30-in. diameter pipe will be produced as soon as the equipment is complete and other lengths and sizes will be added to the line when all installations are finished to produce approximately 50 miles of pipe per month.

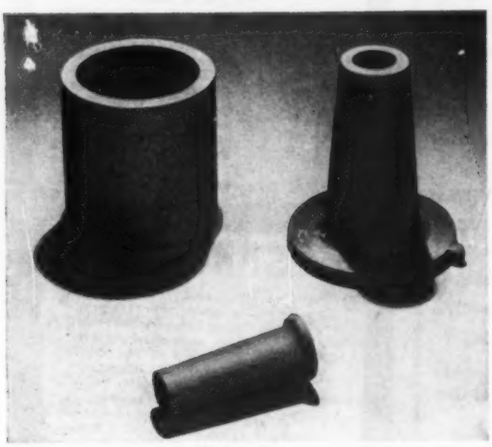
TVA Power Transformers Improved by Westinghouse

Sharon, Pa.—The four power transformers to be built here by Westinghouse Electric Corp. for the Tennessee Valley Authority will take up less room than earlier models of similar capacity due to improved engineering designs and materials. They will be 18 ft high, 17 x 20 ft around.

The transformers, to be installed at the new Johnsonville, Tenn., steam plant of TVA, will be completed about 1951. Each unit will have a rated capacity of 140,000 kva, and will boost voltage from 13,200 at the generating plant to 161,000, for long distance transmission. It is the first time that such a high rating has carried so high a transmission voltage.

Westinghouse said the transformers will be of 3-phase variety, with forced-oil and air-cooling, and will weigh 155 tons each. Overall cost will be about $900,000.

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FATIGUE CRACKS

Continued from Page 20

answer submitted by W. B. Farnsworth. We reasoned out the left hand digit of the sum and went on from there, although there may be a better way of doing it.

This matter of giving definite answers is slightly fraught with danger, as witness the correspondence we've been having with Walter Coopey, engineering consultant for du Pont's polychemicals department. We had a formula to prove that you could weigh anything from 1 to 40 lb with a balance and four weights of 1, 3, 9 and 27 lb, and were backed up by answers received from all the loyal readers except Mr. Coopey. He suggested we try 7, 8, 12 and 13 lb. By trial and error, we tested up to a point where we thought it wouldn't work; but then Mr. Coopey showed us how it would. After further research, we still can't make it.

W. E. Hoare of the Tin Research Institute, Inc., Columbus, Ohio, and Middlesex, England, tosses us this one: A man has nine billiard balls, all of equal size and color. Eight are of equal weight, and the ninth slightly heavy. He is equipped with a simple balance but no weights. What is the minimum number of weighing operations needed to separate the heavy ball, certainly and without relying on luck?

Down Under

Way back last September, this department aired a difference of opinion over "What Constitutes a Burr?" By the middle of October, this had boiled down to 0.001 in. of rough metal left by a stamping die, which we considered too little to worry about.

By the middle of December your f.f.j. had worked its way down to Australia by one of the infrequent mail steamers, and Reader D. H. Ferguson (as we make out his signature) immediately took pen in hand to give us the Australian version. We received his answer by return slow boat last week:

"In Australia a 'burr' can mean a washer used under the driven end of a rivet against wood or similar material to prevent splitting and to provide a better distribution of the grip. What is the American term? Another word for the same thing used in England, at any rate in the boat building trade, is 'rove.'"

We thought our international differences in the metalworking field were over when the uniform screw threads were adopted, but now it looks like the standards engineers will have to go to work on uniform burrs.

-Resume Your Reading on Page 21

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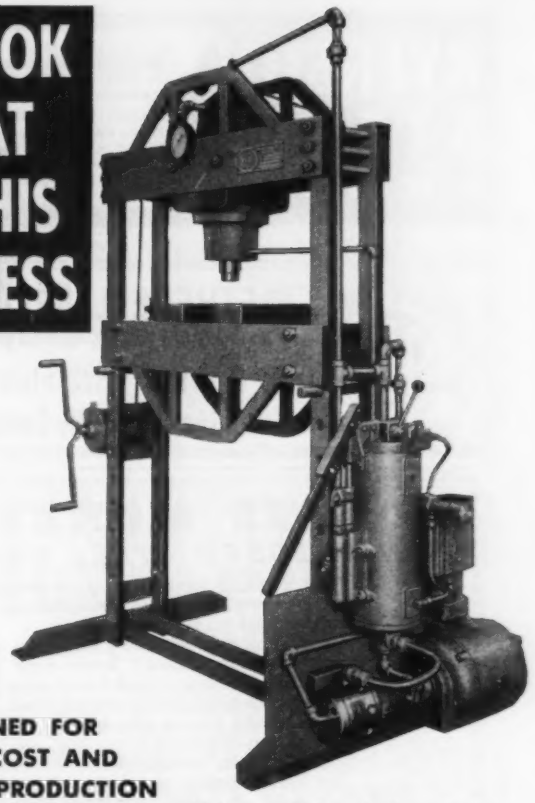
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Depending upon capacity of pumping equipment, prices of Standard model motor driven hydraulic presses are as follows, F. O. B. Factory: 25-ton press from $727.00 to $992.00. 50-ton press from $806.00 to $1058.00. 60-ton press from $1070.50 to $1135.00. 75-ton press from $1198.00 to $1258.00. All motors in the above units are 220/440 volt, 3 phase, 60 cycle. Any change in motor specifications is extra. **Subject to change without notice.*

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IRON AGE INTRODUCES

Continued from Page 132

Huntly M. Campbell, formerly sales manager of the mill products division, WESTERN BRASS MILLS, has become sales manager of mill and fabricating products for the western division. **E. N. Rousseau,** previously sales manager of the fabricating division, will become sales manager of mill and fabricating products in the eastern division, including all districts east of Cleveland.

Arthur W. Retzel received the appointment as sales representative for the Wolverine Tube division of CALUMET & HECLA CONSOLIDATED COPPER CO., Detroit. Mr. Retzel was formerly sales engineer for the EASTWOOD NEALLY CORP. and sales representative for SCOVILL MFG. CO. He will establish headquarters in Philadelphia.

Leon A. Blum became sales manager for the San Francisco plant of the Federated Metals division, AMERICAN SMELTING & REFINING CO. He succeeds **Forest A. Wahlheim,** retired. At the same time, **Donald H. Beilstein** was made assistant plant superintendent. Mr. Blum has been with the company for about 30 years, and Mr. Wahlheim for 43 years.

Wallace F. Schott will represent HOLCROFT & CO., Detroit, in eastern Ohio and western Pennsylvania. His headquarters are in Cleveland.

D. M. Berges was named chief engineer of the Pesco Products division of the BORG-WARNER CORP., Chicago. Mr. Berges' appointment fills a vacancy in the engineering department organization which has existed since J. A. Lauck's election as vice-president in charge of engineering several months ago.

Melvin O. Monsler was made sales manager of the P & H welding division of the HARNISCHFEGER CORP., Milwaukee. Mr. Monsler has been associated with Harnischfeger in welding sales for 12 years, and previously was an instructor in welding and shop procedures at the Milwaukee School of Engineering.

OBITUARIES

Arthur Richmond Forsyth, 77, vice president and treasurer of the Gulf States Steel Co., Gadsden, Ala., when it was purchased in 1937 by Republic Steel, died Feb. 8 at Birmingham.

Harry Sobel, 46, president and general manager of Orange Foundry Co., Orange, Mass., died Feb. 2.

Frederic Alan Schaff, chairman of the board of Combustion Engineering - Superheater, Inc., New York, died on Feb. 7.

Howard R. Crawford, 62, vice president, assistant secretary and assistant treasurer of National Automotive Fibres, Inc., died recently.

Clarence E. Seage, 61, died on Feb. 6. Mr. Seage was a nationally known structural engineer and was one of the designers of the San Francisco-Oakland Bay Bridge and designed the McNary Dam on the Columbia River.

John Buck, assistant works manager of the Scullin Steel Co., St. Louis, died recently.

Resume Your Reading on Page 133

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See our Adv. on page 455 Jan. 5 Iron Age

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SCREW MACHINES

Nat'l Acme RA 9/16" spdle. 6, 2885 max. rpm., tooling & attachments (very late)

Potter & Johnston #6DRE Auto. chucker, 34" swing, 5 face turret. Timken bearing, tooling.

Cleveland 3¾" and model "A" sgl. spdl. auto. screw, quantity of tooling (very late).

BORING MILLS

Universal 4" bar "Tri-Way", face plate to outer support 72", #6 taper, added vertical range (late).

Defiance 25A, 3¾" bar, face plate to outer support 102", #6 taper, added vertical and cross range (late).

Lucas #41, 3" bar, face to outer support 72", #5 taper (late).

Bullard 24" and 36", "spiral drive" 24", 36" and 42", "New Era" type vertical, 3-jaw and 4-jaw chuck tables.

Betts 16' M.D. D.C. vertical, 2 swivel heads on cross rail, rapid trav. elec. control complete.

VERTICAL MILLERS

Brown & Sharpe #2 Lite type, wkg. table 45" x 10", range 28" x 18" x 10" (late).

Milwaukee #2K and #3K High speed (very late).

Ingersoll 18" x 12', 2 spdl. openside planer, type keyway and spline, A.C. M.D.

Brown & Sharpe #2 Standard, wkg. surface tbl. 45" x 14½", range 28" x 14" x 14", 1200 rpm. max. speed. (late).

UNIVERSAL MILLERS

Van Norman #25U Horiz. Knee type, wkg. tbl. 50" x 12", range 24¼" x 10" x 17" (very late).

Cinn. 1M Motor-in-base, wkg. tbl. 40" x 10½", range 22" x 8" x 18", attchmts.

Brown & Sharpe #3A, motor-in-base, wkg. tbl. 50" x 11¼", range 29½" x 12" x 19".

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K&T #2K Vert. Miller, P.F. to Head, Rt. Table

K&T #4H Vert. Miller, P.F. to Head

K&T #5H Plain Mill, table 94" x 18"

CINN. #2 Hi Speed Dial Type Vertical Miller, P.F. to Head

GISHOLT #4 Univ. Turret Lathe (Bar)

J&L #7A Univ. Turret Lathe (Chuck)

WARNER & SWASEY #3 Univ. Turret Lathe (Bar)

HEALD #49 Borematics

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THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Newark "Private Sale" moves 42 pct of listed machines on first showing

Chicago reports large sheet metal forming equipment in greatest demand

Inquiries and sales active in the Philadelphia area; accent on price

"Private Sale" Draws Buyers, Sells Machines in Secret Plant

Newark — Forty-two pct of the machines listed for sale in the recently announced "Private Sale by Invitation Only," were reported to have been sold during the first inspection period, Feb. 4 and 5. In dollars this was said to amount to 63 pct of the dollar value of the machines listed. More than 180 representatives from 106 firms in 16 states attended this unusual sale. Most of the remaining machines were either sold at the next inspection period, Feb. 11, or were under negotiation.

Used Machinery Continues Upward Trend in Chicago Area

The upturn of the past two or three months in the Chicago area used machinery business is continuing. Though no one in the trade expects that a boom is developing, pessimists who felt that the pickup was a flash in the pan are now at least admitting that signs indicate a strength which could mean maintenance of reasonably healthy business levels for some time. Among the encouraging factors are the fact that current activity seems to be spreading to all firms and to all types of equipment, and is coming equally from all types of purchasers.

Forming Machine Demand Up

Sheet metal forming equipment, particularly in large sizes, continues to be in the greatest demand. Auctions find buyers traveling from all over the midwest to look for some of the hard to get items like gang slitters and large double crank presses. Prices are at least firm on all types of machinery, and recent auctions have been showing progressively higher prices and a great interest in getting equipment into its new location and in operation as soon as possible.

In fact, the used equipment which is in greatest demand seems to be that for which manufacturers still have backlogs so that it can't be obtained new without delay. Actual optimism in the used machinery trade is rare and few dealers will say that current business is good, but at least it has picked up from the doldrums of the past year when many dealers in this area were keeping their books in red ink.

Buyers in Philadelphia Reported Shopping for Price

Philadelphia—Most used machinery dealers in this area are experiencing an active rate of inquiries and sales. Even the more pessimistic admit a higher rate of activity than during the latter part of last year.

The trend to shop for, and put price first, is growing. This has been found to be true in dealings with a few large corporations, and especially true of most small firms.

Although no definite buying pattern has been set, dealers report that slitters, shears, pumps, compressors, and vertical and horizontal boring mills have been in active demand. Electrical dealers complain that motors are a drug on the market.

In most cases Philadelphia deal-

(Turn to Page 154)

THE CLEARING HOUSE

EASTERN REBUILT MACHINE TOOLS

MANUFACTURING TYPE MILLING MACHINES
No. 00 Sundstrand Hydraulic Rigidmill, m.d., latest
No. 0S Cincinnati Model EA, m.d., latest
No. 12 Brown & Sharpe, m.d.
No. 1-12 Cincinnati, m.d., latest
No. 1-18 Cincinnati, m.d., latest
No. 2-18 Cincinnati, m.d., with rise & fall, latest
No. 2-24 Cincinnati, m.d., latest
No. 4-48 Cincinnati Plain Hydromatic, m.d., latest
No. 4-48 Cincinnati Duplex Hydromatic, m.d., latest
No. 24-36 Cincinnati Duplex Hydromatic, m.d., with tracer control, latest
No. 24-36 Cincinnati Plain Hydromatic, m.d., with tracer control, latest
No. 56-72 Cincinnati Duplex Hydromatic, m.d., latest
No. 56-90 Cincinnati Duplex Hydromatic, m.d., latest
Type P Ohio Mfg., m.d.
Sundstrand Rigidmill, m.d.
4" Pratt & Whitney Spline, m.d.
No. 33 Kempsmith Mfg., s.p.d.
18", 24" Cincinnati Plain Automatic, m.d.
24", 48" Cincinnati Duplex Automatic, m.d.
30"x36"x12' Ingersoll Slab Milling Machine, 2 heads, m.d.
72"x6' Ingersoll Single Horizontal Spindle Traveling Housing Milling Machine, m.d.

THREAD MILLING MACHINES
No. CT-36 Lees-Bradner, m.d., latest
No. CT-54 Lees-Bradner, m.d., latest
Hall Planetary, m.d.
4½x12", 6x14", 6x48", 6x20", 6x80" Pratt & Whitney
10x24" Hanson Whitney, m.d., latest
10x48" Hanson Whitney, m.d.

HAND MILLING MACHINES
United States, vee belted m.d.
No. 1 Kent-Owens, m.d.
Atlas Model MF Bench, m.d.
No. 1 Standard, m.d.
No. 2 Productomatic, m.d.
No. 3 Garvin, m.d.

PLAIN MILLING MACHINES
No. 000 Brown & Sharpe, m.d., latest
No. 1A Milwaukee, m.d.
No. 1M Cincinnati, m.d.
No. 1 Special Plain Kearney & Trecker Milwaukee, m.d.
No. 1½, 2, 3 Cincinnati, cone
No. 2B Brown & Sharpe, m.d., latest
No. 2 Cincinnati H.S. Dial, m.d., latest
No. 2 Rockford, m.d.
No. 2HL Milwaukee, m.d., latest
No. 3 Cincinnati H.S. Dial, m.d., latest
No. 3 Standard Cincinnati, m.d.
No. 3B Brown & Sharpe, m.d., late
No. 3, 4 Kempsmith Maxi-Miller, m.d.
No. 3B Milwaukee, m.d.
No. 3 Van Norman Duplex, s.p.d.
No. 4 Cincinnati H.P., m.d.
No. 4 Ohio, cone
No. 5 Cincinnati, rect. overarm, m.d.
No. 5 H.D. LeBlond, s.p.d.
No. 5B Brown & Sharpe Heavy, m.d.

UNIVERSAL MILLING MACHINES
No. 1B Milwaukee, m.d.
No. 2A Brown & Sharpe, s.p.d.
No. 2 Cincinnati Medium Speed Dial, m.d., latest
No. 2 Cincinnati, cone, motorized
No. 2M Cincinnati, m.d.
No. 2 Kempsmith, cone
No. 3 Kempsmith, cone
No. 3A Brown & Sharpe, s.p.d.
No. 4A Brown & Sharpe, m.d.
No. 4 Cincinnati H.P., m.d.
No. 4G LeBlond, s.p.d.

VERTICAL MILLING MACHINES
No. 0S Cincinnati, m.d., latest
No. 2M Cincinnati, m.d.
No. 3, 4 Cincinnati H.P., m.d.
No. 2, 3, 4 Cincinnati High Speed Dial, m.d., latest
No. 2, 3 Cincinnati Medium Speed Dial, m.d., latest
No. 2H, 4H Milwaukee, m.d., latest
No. 2HL Milwaukee Swiveling Head, m.d., latest
No. 2K, 3K, 4K Milwaukee Dial, m.d., latest
No. 2½B, 3B, 4 Milwaukee, m.d.
No. 3V Toledo, s.p.d.
No. 3V Van Norman, m.d., latest
No. 5 Brown & Sharpe, cone
No. 5 Jackson, m.d.
No. 5 Reed-Prentice, m.d., latest
No. 6 Becker, cone
Cincinnati Hydromatic, m.d., 2 spindles
28-120 Cincinnati Hydrotel, m.d., 1942 machine

PLANERS
P10 Coulter Crank Type Shaper-Planer, 1 head, m.d.
20"x20"x5' Whitcomb-Blaisdell Planer, belted m.d., 1 head
24"x24"x6' Cincinnati, m.d., 2 heads
30"x30"x10' Cincinnati, belted m.d., 2 heads
30"x30"x10' Gray, 2 heads, belt
30"x30"x14' Gray, 2 heads, belt
32"x32"x16' Gray, 2 heads, belt
36"x36"x10' Cincinnati, belted m.d., 2 heads
36"x36"x10' Niles, 2 heads, belt
36"x36"x18' Niles-Bement-Pond, 2 heads, reversing m.d.
36"x36"x20' Cincinnati, 2 heads, belt
36"x36"x20' Gray, 2 heads, belt
36"x36"x24' Cincinnati, belted m.d., 2 heads
38"x38"x20' Gray Spiral Drive, 2 heads, belt
42"x42"x26' Gray, 2 heads, belted m.d.
48"x48"x18' Detrick & Harvey, 4 heads, reversing m.d.
48"x48"x28' Cincinnati, 4 heads, reversing m.d.
48"x48"x30' Cincinnati, 4 heads, m.d.
48"x48"x32' Niles-Bement-Pond, 4 heads, reversing m.d.
48"x48"x40' Sellers, 2 heads, reversing m.d.
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LATHE, 42" x 32' Bridgeport, Grd. Head
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No. 2FU Foster Fastermatic Serial No. 2FU529, new in 1944. Quite a little tooling.

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Cincinnati Hydromatic Sizes: 3-24, 34-36, 4-36, 4-48, 5-48, 56-72 and 56-90.

PRESSES

1000 ton, No. 666 Toledo knuckle joint Coining. 2½" stroke, 18" shut height, bed 37" F to B x 31" R to L.

350 ton Clearing Crankless, model F1350-42, serial No. 45-11155P, new 1945. 20" stroke, 28" shut height, 36" x 42" bed.

600 ton Hamilton No. 2316½ eccentric shaft forging. Stroke 4"; shut height 16", bed 28" F to B x 23¾" R to L.

No. 506 Bliss on inclined legs with double roll feed and scrap cutter. About 126 tons. 3" stroke, 11½" shut height.

1000 ton Baldwin Southwark "Hy-Speed" hydraulic. 20" stroke, 56" daylight, bed 42" F to B x 54" R to L.

UPSETTERS

2" National. Serial No. 13213. Has suspended slides with long overarm guide. Has 15 HP motor.

4" Ajax. Serial No. 3156. Has twin drive gears, suspended slides, self contained backshaft, 30 HP motor.

MILES MACHINERY CO.
SAGINAW, MICH.

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ers report than only the latest type machine tools are in demand. However, a few sources admitted that the older machines, some 10 to 15 years old, were moving. Quite a few small firms starting in the area, and operating on limited capital, have been shopping for the older type items.

Chrysler Strike Causes Cancellation of Press Orders

Philadelphia—Up until the present time presses of all types, brakes, shears, and slitters have been moving at an accelerated rate in the Philadelphia area. One dealer reports that he moved more presses during the previous six weeks than he did all last year.

Recently there has been a slow up in both inquiries and sales of these and kindred items. In two instances orders of medium and heavy presses have been cancelled. These orders, involving from 5 to 9 presses, were from subcontractors of the Chrysler Corp. who manufacture automotive hardware items. The strike was given as the reason for cancellation.

Niagara Chapter Elects Officers

Buffalo—The new Niagara chapter of the National Industrial Service Assn., setup to serve Buffalo and surrounding territory, is now a functioning unit. By-laws were adopted and officers elected at the January 23 meeting. The officers elected were: Karr Parker, Jr., pres.; R. F. Hornbeck, 1st vice pres.; Barton Wardell, 2nd vice pres.; C. W. Tanner, 3rd vice pres.; Ralph Barker, 4th vice pres., and N. C. Robinson, secy.-treas.

Norry Expands Again

Rochester—The Electric Equipment Co. has acquired a War Assets building on Cairn Street, Rochester and intends moving its warehousing operations into its 60,000 sq ft storage area in March 1950, according to Irving S. Norry, president. This is in keeping with Mr. Norry's insistance on maintaining a large stock.

Resume Your Reading on Page 151

CIMCO MACHINE TOOLS AT BARGAIN PRICES

BORING MILLS
Bullard 24" New Era, Vertical
Bullard 42" Late Type
Lucas #31, 3" bar, Horiz.
P & H Floor Type, Horiz, 4" spindle
Niles 36", Vert., M.D.
King 52", Vert., M.D.

DRILL PRESSES
Leland Gifford 24" Single Spindle
Coburn #4, Mfg. Type Single Spindle

RADIAL DRILLS
American 3½' Triple Purpose
American 5' Triple Purpose
Carlton 5', Ball Bearing
Fosdick 5' 14" col.

GRINDERS
Brown & Sharpe #13, Univ. & tool
Landis 10x24, Type C, Hydraulic
Heald 70A Internal (1941)
Excello 31L, Precision Thread
Norton 6x18, Surface
Thompson 12 x 16 x 16 Surface Grinder
ExCello #35L Precision Thread Grinder
Gallmeyer & Livingston #4 Univ. Tool Grinder
Cincinnati 14" x 36", Hyd.

LATHES
Lodge & Shipley 14" x 30" centers, Late model
American Pacemaker 16" x 78" centers (1948)
Lodge & Shipley 18" x 8' bed, Selective Geared Head
Sebastian Streamliner 20' x 8' centers
American 24" x 10' bed, G. H.
American 24" x 14' bed, 8 speed, G. H.
American 42" x 14' bed, Internal Face Plate Drive
Sidney 24" x 168" centers, equal to new
Niles Timesaver 30" x 10' centers

MISCELLANEOUS
Cincinnati #3 Dual Type Medium Speed, Plain Miller
Cincinnati #3 High Speed Dial Type Plain Miller
Warner & Swasey #5 Turret Lathe, Pressolector Head
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Cincinnati Bickford 21" Upright Drill Press

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Continued from Page 28

Germany failed to maintain shipments under a trade agreement.

The acute shortage of iron and steel in the Soviet Sector, which caused a number of factories to shut down, gives West Germany a fairly good bargaining position. Russia or its satellites cannot compensate for the loss of West German iron and steel shipments.

East Germany has concentrated almost exclusively on the purchase of iron and steel, which have accounted for 80 pct of its purchases from West Germany. A trade agreement between the two governments limited the shipment of iron and steel to 33 pct of all purchases by the Soviet Zone.

At the present delivery rate, East Germany would have received all of the 180,000 tons of steel allocated by West Germany by the end of March. This is three months before the East-West trade agreement ends. It seems likely that the Soviet Sector would not be interested in buying the other goods in the agreement if West Germany sent them all the iron and steel. Berlin's electric industry, which was given a share in the agreement, would suffer.

French Assembly Restores Free Collective Bargaining

Paris—A law restoring free collective bargaining has been passed recently by the French National Assembly. It opens a new era in wage and salary discussion by outlining the procedure union representatives and employers will follow in negotiations, and by eliminating the present method of government wage fixing.

The nature, form and contents of the new collective bargaining agreements are included in the law. These agreements may be national, regional or local. They must contain minimum salary specifications. A collective bargaining committee composed of the Minister of Labor, or his representative, the Minister of National Economy, the president of the Social Section of the Council of State and representatives of workers and employers, is provided. The committee will study the standard family budget in an effort to formulate a minimum wage.

Canada Halts Scrap Controls

Ottawa—Canada's Price Board announced recently the removal of price controls on steel scrap. The board's action brought to an end the last of Canada's war-time commodity controls, under Price Board regulation. The elimination of steel scrap price ceilings is another step in the direction of freeing iron and steel from government control and allowing the industry greater authority over its movement.

Resume Your Reading on Page 29

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